

Systematic study of pentaquark states: $qqq - q\bar{q}$ configuration

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Abstract

Group theoretic method for the systematic study of five-quark states with meson-baryon ($q\bar{q} - q^3$) configuration is developed. The calculation of matrix elements of many body Hamiltonian is simplified by transforming the physical bases (meson-baryon quark cluster bases) to symmetry bases (group chain classified bases), where the fractional parentage expansion method can be used. Three quark models, the naive Glashow-Isgur model, Salamanca chiral quark model and quark delocalization color screening model, are used to show the general applicability of the method and general results of constituent quark models for five-quark states are given. The method can also be useful in the calculation of meson-baryon scattering and the study of the five-quark components effect in baryon structure. The physical contents of different model configurations for the same multi-quark system can also be compared through the transformation between different physical bases to the same set of symmetry bases.

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I. INTRODUCTION

After 40 years of quark model study, the idea about baryon and meson is about to go beyond the naive picture: baryon q^3 and meson $q\bar{q}$. The proton spin puzzle could be explained by introducing the $q^3q\bar{q}$ component in the quark model [1]. Recently to understand the strange magnetic moment of proton, the five-quark component of proton was proposed [2]. The recent progresses on meson spectroscopy called for the tetra-quark components [3]. Although the pentaquark states claimed by experimental groups few years ago might be disappeared and the multi-quark states might be hard to be identified, the multi-quark study is indispensable for understanding the low energy quantum chromodynamics (QCD), because the multi-quark states can provide information unavailable for $q\bar{q}$ meson and q^3 baryon, especially the property of hidden color structure. Generally a multi-body interaction multi-channel coupling calculation is needed in the multi-quark study. Therefore a powerful method is necessary. The fractional parentage (fp) expansion technique has been proven as a powerful method for few-body problem.

To full play the powerful group theoretic method for quark model calculation of multi-quark system, one needs not only the fractional parentage expansion coefficients of these multi-quark states but also a relation between various quark model states (hereafter called physical bases) and the group theoretical classification states (hereafter called symmetry bases). Such a method has been developed and successfully applied in systematic search of dibaryon [4] and five-quark states with Jaffe-Wilczek di-quark configuration [5], where the physical bases were transformed to symmetry bases first, then the many-body matrix elements calculation of Hamiltonian (with two body interaction) on the symmetry bases was done by means of fractional parentage expansion, *i.e.*, the many-body matrix elements can be reduced to overlap and two-body matrix elements. At last the matrix elements on the symmetry bases were transformed back to physical bases.

The present work is to provide the transformation coefficients between physical bases and symmetry bases of five-quark systems to facilitate the calculation of many body Hamiltonian matrix elements. The physical bases discussed in this paper is the the meson-baryon bases. For Jaffe-Wilczek (JW) di-quark bases, see the first paper of this series [5]. The method is applied to the quark model calculation of five-quark systems with three quark models: the naive quark model, *i.e.*, the Glashow-Isgur model [6], the Salamanca version of chiral quark

model [7] and the quark delocalization color screening model (QDCSM) [4, 8]. The general applicability of this method is verified through these model calculations.

Even though the multi-quark system might be hard to be identified, the method is still useful in the study of hadron-hadron scattering and the multi-quark components effect in hadron in the framework of quark model. The transformation between physical bases and symmetry bases is also useful in the study of the physical contents of different model approaches for the same multi-quark system. This report gave an example where the different model approaches in the study of pentaquark states are compared.

In section II, the physical bases and symmetry bases are introduced and the transformation between them is derived. The fractional parentage technique applied to calculate the matrix elements on the symmetry bases is also explained in this section. Section III explains three quark models we used. The results of the systematic calculation of five-quark system in the u, d, s 3-flavor world are given in section IV. The last section gives the summary.

II. PHYSICAL BASES AND SYMMETRY BASES

The physical bases are constructed as follows, first the wave function of each quark cluster is constructed based on the group chain classification

$$\begin{array}{ccccccccccc} [1^n] & [\nu] & [\tilde{\nu}] & [c] & [\mu] & [f] & I & Y & J \\ \text{SU}_{36} \supset \text{SU}_2^x \times \left\{ \text{SU}_{18} \supset \text{SU}_3^c \times \left[\text{SU}_6 \supset \left(\text{SU}_3^f \supset \text{SU}_2^\tau \times \text{U}_1^Y \right) \times \text{SU}_2^\sigma \right] \right\} \end{array} \quad (1)$$

(the Young diagrams or quantum numbers for each group are also shown in Eq.(1)), then the quark cluster wave functions of the system was coupled to definite color, spin and isospin quantum numbers by Clebsch-Gordan (CG) coefficients of color SU_3^c , spin SU_2^τ and isospin SU_2^σ group, and finally anti-symmetrized. For meson-baryon ($q\bar{q} - q^3$) configuration, the five quarks are separated into two clusters: the meson and baryon clusters with separation S . The physical basis (meson-baryon basis) is defined as

$$\Psi_{\alpha k}(q^4 \bar{q}) = \mathcal{A} [\psi_3(q_1 q_2 q_3) \psi_2(q_4 \bar{q}_5)]_{W_c M_I M_J}^{[c] I J}, \quad (2)$$

where \mathcal{A} is a normalized antisymmetrization operator for four quarks. ψ_3 and ψ_2 are wave-functions of baryon and meson, respectively. $[]$ means coupling in terms of the SU_3^c , SU_2^τ , SU_2^σ CG coefficients so that it has color symmetry $[c]W_c$, isospin IM_I , and spin JM_J .

$\alpha = (YIJ)$, k represents the quantum numbers $\nu_3, \nu_2, c_3, \dots, J_2$, which specify the baryon and meson states. In order to relate the physical bases to the symmetry bases, the 4-quark cluster basis is introduced

$$\Psi_{\alpha_4 k_4}(q^4) = \mathcal{A}[\psi_3(q_1 q_2 q_3) \psi_1(q_4)]_{W_{c_4} M_{I_4} M_{J_4}}^{[c_4] I_4 J_4}, \quad (3)$$

where $\alpha_4 = (Y_4 I_4 J_4)$, k_4 represents the quantum numbers $\nu_3, \nu_1, c_3, \dots, J_1$. Coupling the anti-quark basis to 4-quark basis Eq.(3) in terms of SU_3^c , SU_2^τ , SU_2^σ CG coefficients, gives the 5-quark basis

$$\left[\Psi_{\alpha_4 k_4}(q^4) \psi_{[\bar{c}]\bar{I}\bar{J}}(\bar{q}_5) \right]_{W M_I M_J}^{[c] I J}$$

It relates to the physical basis through the SU_3^c , SU_2^τ , SU_2^σ Racah coefficients,

$$\begin{aligned} \Psi_{\alpha k}(q^4 \bar{q}) &= U(c_3 c_1 c c_{\bar{1}}; c_4 c_2) U(I_3 I_1 I I_{\bar{1}}; I_4 I_2) U(J_3 J_1 J J_{\bar{1}}; J_4 J_2) \\ &\times \left[\Psi_{\alpha_4 k_4}(q^4) \psi_{[\bar{c}]\bar{I}\bar{J}}(\bar{q}_5) \right]_{W M_I M_J}^{[c] I J}, \end{aligned} \quad (4)$$

where U 's are Racah coefficients, defined as,

$$U(c_3 c_1 c c_{\bar{1}}; c_4 c_2) = \sum_{\text{all } W's} C_{[c_3]W_{c_3}, [c_1]W_{c_1}}^{[c_4]W_{c_4}} C_{[c_4]W_{c_4}, [c_{\bar{1}}]W_{c_{\bar{1}}}}^{[c]W_c} C_{[c_1]W_{c_1}, [c_{\bar{1}}]W_{c_{\bar{1}}}}^{[c_2]W_{c_2}} C_{[c_3]W_{c_3}, [c_2]W_{c_2}}^{[c]W_c}.$$

The Racah coefficients can be found in Ref. [9].

The symmetry basis of 4-quark system can be defined as,

$$\Phi_{\alpha_4 K_4}(q^4) = \left| \begin{array}{c} [\nu_4] W_{\nu_4} \\ [c_4] W_{c_4} [\mu_4] [f_4] Y_4 I_4 M_{I_4} J_4 M_{J_4} \end{array} \right\rangle, \quad (5)$$

which is the basis vector belonging to the irreducible representations of group chain Eq.(1) with $n = 4$. In Eq.(5) K_4 stands for $\nu_4 \mu_4 f_4$. Coupling the antiquark to Eq.(5), the symmetry bases for 5-quark is obtained

$$\Phi_{\alpha K}(q^4 \bar{q}) = \left[\Phi_{\alpha_4 K_4}(q^4) \psi_{[\bar{c}]\bar{I}\bar{J}}(\bar{q}_5) \right]_{W M_I M_J}^{[c] I J}. \quad (6)$$

To relate the symmetry basis to physical basis, first we express the four-quark cluster basis Eq.(3) in terms of the symmetry basis Eq.(5) [10, 11, 12],

$$\Psi_{\alpha_4 k_4}(q^4) = \sum_{\tilde{\nu}_4 \mu_4 f_4} C_{[\tilde{\nu}_3][c_3][\mu_3], [\tilde{\nu}_1][c_1][\mu_1]}^{[\tilde{\nu}_4][c_4][\mu_4]} C_{[\mu_3][f_3][J_3], [\mu_1][f_1][J_1]}^{[\mu_4][f_4][J_4]} C_{[f_3]Y_3 I_3, [f_1]Y_1 I_1}^{[f_4]Y_4 I_4} \Phi_{\alpha_4 K_4}(q^4), \quad (7)$$

C' 's are the isoscalar factors (ISFs) of $SU_{mn} \supset SU_m \times SU_n$, which can be obtained from Chen's book [9]. Then, the physical bases and symmetry bases for 5-quark can be transformed to each other by

$$\begin{aligned}\Psi_{\alpha k}(q^4\bar{q}) &= \sum_K C_{kK} \Phi_{\alpha K}(q^4\bar{q}) \\ &= \sum_{\tilde{\nu}_4 \mu_4 f_4} \{UUU\}_{\text{Racah}} \{CCC\}_{\text{ISF}} \Phi_{\alpha K}(q^4\bar{q}).\end{aligned}\quad (8)$$

here, $\{UUU\}_{\text{Racah}}$ are the Racah coefficients in Eq. (4); $\{CCC\}_{\text{ISF}}$ are the isoscalar factors in Eq. (7). All the transformation coefficients are tabulated in the appendix.

A physical 5-quark state with quantum number $\alpha = (YIJ)$ is expressed as a channel coupling wave function

$$\Psi_{\alpha}(q^4\bar{q}) = \sum_k C_k \Psi_{\alpha k}(q^4\bar{q}). \quad (9)$$

The channel coupling coefficients C_k is determined by the diagonalization of the 5-quark Hamiltonian as usual. As before, the calculation of Hamiltonian matrix elements in the cluster bases is replaced by that of matrix elements in the symmetry bases, where the fractional parentage technique can be used. The calculation of the matrix elements in symmetry bases is given in Ref.[5], we will not repeat the procedure here.

III. QUARK MODELS AND CALCULATION METHOD

The models used in the calculations are naive quark model, Salamanca chiral quark model and quark delocalization color screening model. The Hamiltonian of these models have been given in the first paper of this series [5]. The only modification is the delocalized single particle orbital wavefunction, which is given below for the baryon-meson basis:

$$\begin{aligned}\psi_l(\vec{r}) &= (\phi_L + \epsilon_1 \phi_R)/N(\epsilon_1), \\ \psi_r(\vec{r}) &= (\phi_R + \epsilon_2 \phi_L)/N(\epsilon_2),\end{aligned}\quad (10)$$

$$\begin{aligned}N(\epsilon_1) &= \sqrt{1 + \epsilon_1^2 + 2\epsilon_1 \langle \phi_R | \phi_L \rangle}, \\ N(\epsilon_2) &= \sqrt{1 + \epsilon_2^2 + 2\epsilon_2 \langle \phi_R | \phi_L \rangle}.\end{aligned}\quad (11)$$

where ϵ_1 denotes the quark in baryon orbit delocalized into meson orbit, while ϵ_2 is from meson to baryon. They are determined by the dynamics of the 5-quark system.

The calculation method is quite the same as in Ref.[5].

IV. RESULTS AND DISCUSSIONS

To take into consideration of the effects of various color structures, the hidden color channels are included in this calculation, which is different from our dibaryon calculation where only color singlet channels are included [4, 12]. Like the systematic study of the JW di-quark configuration, all possible states within the u , d , s three-flavor world have been calculated in this baryon-meson configuration. Both single-channel and channel coupling calculations have been carried out in three quark models. To save space, only several general features and comparison between the JW di-quark and meson-baryon two configurations and among three models are given below.

(1) Generally there exist effective attractions for almost all the states both in the extended QDCSM and the chiral quark model, while there are about ten channels which are pure repulsive in the naive quark model (NN interaction study already showed that the naive quark model is not realistic for hadron interaction, it can not provide the intermediate range NN attraction). In QDCSM, the attraction between decuplet baryons and vector mesons are usually large (> 200 MeV), the attraction between octet baryons and pseudo-scalar mesons are small (less than 10 MeV), and the attraction between octet (decuplet) baryons and vector (pseudo-scalar) mesons lie between. There are also several exceptions. This situation is similar to the baryon-baryon interactions where the attraction between decuplet baryons is large, between octet baryons is small and between decuplet and octet baryons is in between. In chiral quark model, the above general features are kept but with more exceptions. Fig.1 gives several examples. It is clear that $\Delta\rho$, $\Delta\bar{K}^*$ and $\Sigma^*\bar{K}^*$ channels have strong attractions, whereas $\Sigma\pi$, ΣK and $\Xi\bar{K}$ show pure repulsive or very small attractions. More examples can be found in Fig.3-6.

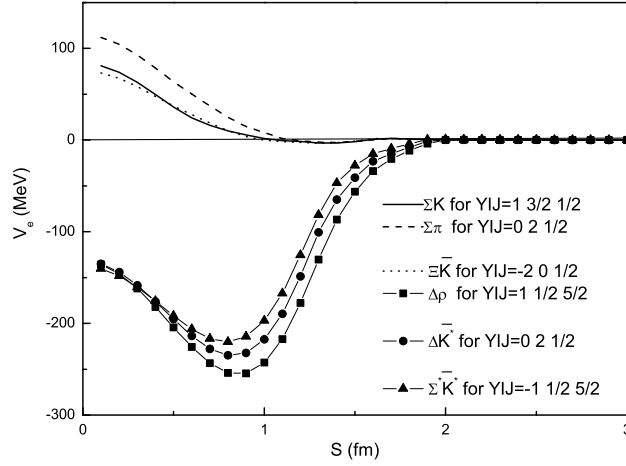


Fig.1 Effective potentials vs cluster separation in QDCSM.

(2) For chiral quark model and naive quark model, most states have very similar results (energy difference less than 30 MeV) for two configurations: $qq-qq-\bar{q}$ and $qqq-q\bar{q}$. For these states, the separations between quark clusters corresponding to the minimum-energy are small (S and/or $T < 0.7$ fm). The differences between two configurations tend to disappear after channel-coupling, the remaining minor differences come from the different quark orbital wave functions used. There are also several states, the energy differences are large (greater than 60 MeV, even 100 MeV) for two configurations. For these states, the separation between quark clusters corresponding to minimum-energy in baryon-meson configuration is a little larger (color-singlet clusters can stay far away), while the ones in JW di-quark configuration are smaller (colorful clusters tend to stay close), that makes the energies different. However, the extended QDCSM gives different results. The di-quark configuration always gives lower energy than baryon-meson configuration. The main reason is that the color confinement is screened between quark pair in different clusters in QDCSM. The more the number of clusters, the lower the model energy. The screened color confinement assumed for quark pair in two color singlet clusters was shown to be reasonable by the previous studies [4, 8], however extends to colorful clusters may be questionable. One may expect there might be additional energy for separating color clusters. Further investigation is needed.

(3) For the states in anti-decuplet, 27-plet and 35-plet the mass hierarchies obtained in meson-baryon configuration are quite similar to that of JW di-quark configuration. Here only the mass hierarchies of $8_f + \overline{10}_f$ states with $J^P = \frac{1}{2}^+$ of two configurations in three

quark models are given in Fig.2.

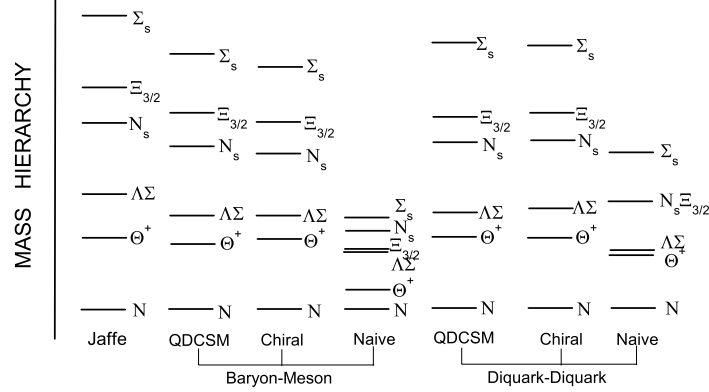


Fig.2 mass hierarchy in the $8_f + \overline{10}_f$ with $J^P = \frac{1}{2}^+$ in three quark models, compared with the one in diquark-diquark configuration and Ref.[13].

(4) Figs.3-6 show the effect of channel coupling (sc stands for single channel, cs for color singlet channel coupling and cc for full channel coupling). For most channels, the effect of channel coupling is small, especially for QDCSM. It is worth to note that the hidden-color states have minor effect on the lowest energy of a channel. Figs.7-8 show that channel coupling effect for $(YIJ) = (00\frac{1}{2})$, where the channel coupling contributes a considerable attraction. However the contribution of hidden-color channels are still negligible, especially for QDCSM. We like to emphasize that this result is based on the assumption that the quark interaction used for hadron spectroscopy and color singlet hadron channels can be directly extend to hidden color channels and this assumption is questionable. In fact we don't have any information about the quark interaction between hidden color channels and colorless ones up to now.

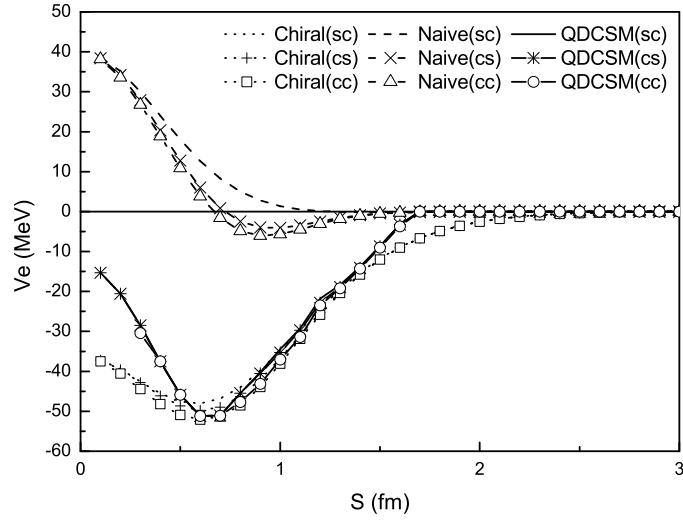


Fig.3 Effective potentials for $(YIJ) = (20\frac{1}{2})$.

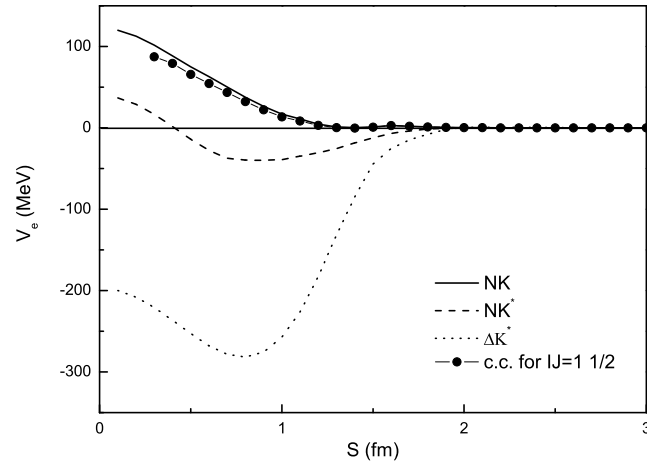


Fig.4 Effective potentials for $(YIJ) = (21\frac{1}{2})$ in QDCSM.

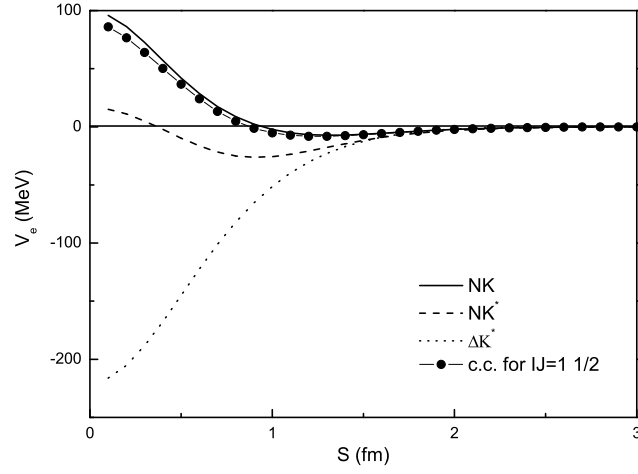


Fig.5 Same as fig.4 for chiral quark model.

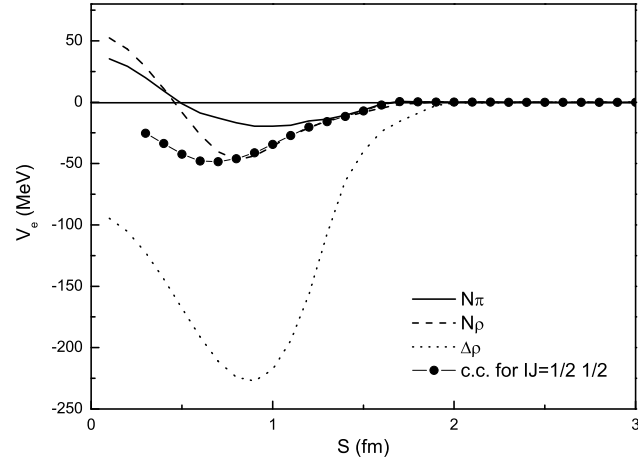


Fig.6 Effective potentials $(YIJ) = (1\frac{1}{2}\frac{1}{2})$. in QDCSM.

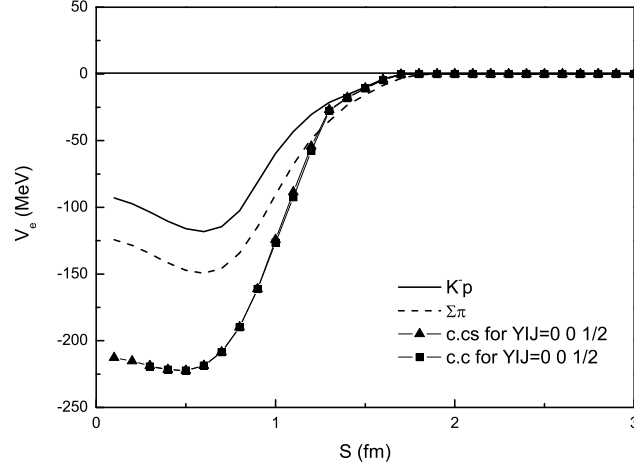


Fig.7 Effective potentials for $(YIJ) = (00\frac{1}{2})$ in QDCSM.

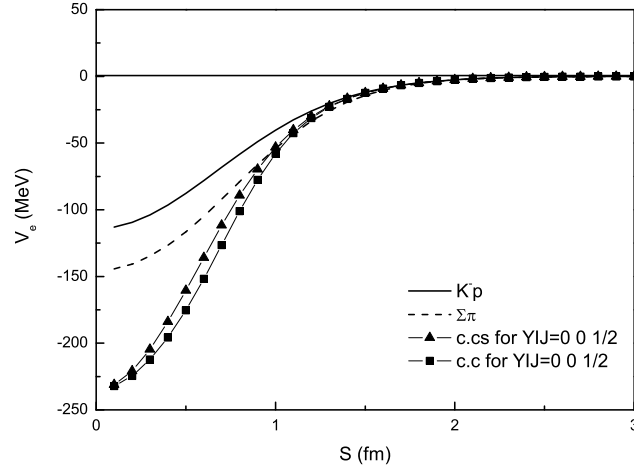


Fig.8 Effective potentials for $(YIJ) = (00\frac{1}{2})$ in chiral quark model.

(5) Generally there exist attractions for baryon-meson system, however in most cases, the attraction is not enough to make the energy lower than the threshold, i.e., the sum of corresponding baryon and meson mass. Therefore there will be no narrow resonances except there is special reason to prevent the decay. Take Θ^+ for example, the lowest energy state here is the KN state. The effective potential for the $N - K$ channels in three quark models is given in Fig.3. For the $I = 0$ S-wave KN state, although the naive quark model gives repulsive potentials, there is a moderate attraction ~ 51 MeV at a separation of 0.6 fm in the QDCSM and a little weaker attraction ~ 48 MeV at a separation of 0.6 fm in the

chiral quark model. (The results are different from the previous calculation [14], where no attraction was obtained. The reason is the effect of σ exchange was reduced in Ref.[14] by using larger mass and ideal mixing of σ_0 and σ_8). In QDCSM, the mass of Θ^+ is 1851 MeV, however the mass of kaon is poorly estimated to be 647 MeV in QDCSM. If we make a correction of the physical mass of kaon, the energy of the state can be reduced to 1700 MeV, which is still too high to match the experimental value 1540 MeV. In the chiral quark model, the case is quite similar to QDCSM.

(6) Finally, there are several interesting states in QDCSM: (1) Their masses are lower than the lowest two- and three-body decay threshold and they might be better pentaquark candidates. However the results are sensitive to model details. For $(YIJ) = (1\frac{1}{2}\frac{5}{2})$ channel, the lowest state has mass around 1822 MeV, which is not only lower than the two-body decay thresholds ($\Delta\rho$), but also lower than the three-body decay thresholds ($N\pi\rho$). And for $(YIJ) = (00\frac{5}{2})$ channel, there is a state with mass around 2017 MeV, which is lower than the corresponding two-body decay threshold $\Sigma^*\rho$ and the three-body decay thresholds ($\Lambda\pi\rho$). (2) K^-p state has been calculated dynamically in order to see if there is a resonance state $\Lambda(1405)$. The mass of K^-p is 1560 MeV. If we make a correction of the physical mass of kaon, the energy of the state can be reduced to 1408 MeV, which corresponds to the observed mass of $\Lambda(1405)$. (3) In Ref.[15], several quasibound states have been proposed, such as $I=1 \Delta K$, $I = \frac{1}{2} \Sigma K$, $I = \frac{1}{2}, \frac{3}{2} N\phi$, and so on. In QDCSM, all these states have been calculated and strong attraction (> 100 MeV) were obtained. The dynamical calculation of these states are in progress.

V. SUMMARY

Multi-quark system is complicate, our knowledge about multi-quark system is limited and there is no well established multi-quark state experimentally up to now. Nevertheless its study is indispensable if one wants to understand the properties of the abundant color structures allowed in QCD. The systematic study could provide the general features of the multi-quark system. In this case, a powerful method is needed. This paper (and the previous one[5]) reports a group theoretic method for five-quark calculation. The method is applied to a systematic study of all possible five-quark states within u, d, s three-flavor world in baryon-meson configuration with three quark models. The powerful feature of group theory

method is shown by the large amount of spectroscopy data obtained easily in this approach (only very limited results have been shown in this report).

In the pentaquark studies few years ago various constituent quark models were proposed. Our transformation between different physical bases to the same set of symmetry bases shows these models are a choice of different parts of the model space of the five-quark system. Our calculation shows that if one uses a large enough model space the differences of these different configuration choices tend to disappear.

Besides the five-quark calculation, the baryon-meson scattering is another field where the technique developed in these two papers can be used. With the progress on the meson spectroscopy of non-relativistic quark model [16], the unified description of hadron properties and hadron-hadron interaction becomes possible. There are a lot of work devoted to baryon-baryon scattering, baryon-meson scattering is less studied. Employing the group theoretic method presented here one can study the baryon-meson scattering within the framework of constituent quark models.

There are experimental indication and theoretical motivation that the pure q^3 baryon and $q\bar{q}$ meson configuration should be modified to include higher Fock components. The effect of the five-quark component $q^3q\bar{q}$ of baryon can be studied as well by the same technique developed here.

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- [1] D. Qing, X.S. Chen and F. Wang, Phys. Rev. **C57**, R31 (1998); **D58**, 114032 (1998).
 - [2] B.S. Zou and D.O. Riska, Phys. Rev. Lett. **95**, 072001 (2005).
 - [3] B. Aubert, *et al*, Phys. Rev. Lett. **90**, 242001 (2003); S.K. Choi, *et al*, Phys. Rev. Lett. **91**, 262001 (2003); A.V. Evdokimov, *et al* (SELEX Collaboration) Phys. Rev. Lett. **93**, 242001 (2004); B. Aubert, *et al*, Phys. Rev. Lett. **95**, 142001 (2005); R.L. Jaffe, Phys. Report **409**,1 (2005).
 - [4] F. Wang, J.L. Ping and T. Goldman, Phys. Rev. **C51**, 3411 (1995); T. Goldman, K. Maltman, G.J. Stephenson, Jr, J.L.Ping and F. Wang, Mod. Phys. Lett. **A13**, 59 (1998); J.L. Ping, F. Wang and T. Goldman, Nucl. Phys. **A688** 871 (2001); H.R. Pang, J.L. Ping, F. Wang and T. Goldman, Phys. Rev. **C65**, 014003 (2001). J.L. Ping, H.R. Pang, F. Wang and T. Goldman,

- Phys. Rev. **C65**, 044003 (2002).
- [5] H.X. Huang, C.R. Deng, J.L. Ping, F. Wang and T. Goldman, Phys. Rev. **C77**, 025201 (2008).
- [6] A. De Rujula, H. Georgi and S.L. Glashow, Phys. Rev. **D12**, 147 (1975); N. Isgur and G. Karl, Phys. Rev. **D18**, 4178 (1978); **D19**, 2653 (1979); **D20**, 1191 (1979).
- [7] A. Valcarce, H. Garcilazo, F. Fernandez, and P. Gonzalez, Rept. Prog. Phys. **68** (2005) 965.
- [8] F. Wang, G.H. Wu and L.J. Teng, *Phys. Rev. Lett.* **69**, 2901 (1992); G.H. Wu, J.L. Ping, L.J. Teng, F. Wang and T. Goldman, Nucl. Phys. **A673**, 279 (2000); L.Z. Chen, H.R. Pang, H.X. Huang, J.L. Ping and F. Wang, Phys. Rev. **C76**, 014001 (2007).
- [9] J. Q. Chen *et al.*, *Tables of the Clebsch-Gordan, Racah and Subduction Coefficients of SU(n) Groups* (World Scientific, Singapore, 1987); *Tables of the SU(mn) \supset SU(m) \times SU(n) Coefficients of Fractional Parentage* (World Scientific, Singapore, 1991).
- [10] M. Harvey, Nucl. Phys. **A352**, 301 (1981); **481** 834 (1988).
- [11] J.Q. Chen, Y.J. Shi, D.H. Feng and M. Vallieres, Nucl. Phys. **A393**, 122 (1983).
- [12] F. Wang, J. L. Ping, and T. Goldman, *Phys. Rev. C* **51**, 1648 (1995).
- [13] R. Jaffe and F. Wilczek, Phys. Rev. Lett. **91**, 232003(2003).
- [14] F. Huang, Z. Y. Zhang and Y. W. Yu *Phys. Rev. C* **70**, 044004 (2004).
- [15] F. Huang, Z. Y. Zhang and Y. W. Yu *Phys. Rev. C* **73**, 025207 (2006);
F. Huang and Z. Y. Zhang *Phys. Rev. C* **72**, 068201 (2005).
- [16] J. Vijande, F. Fernández and A. Valcarce, *J. Phys. G* **31**, 481 (2005).

Appendix

Table A1. Transformation coefficients between physical bases and symmetry bases. The column labels are $[\nu_4]$, $[\mu_4]$, $[f_4]$, $[\sigma_{J_4}]$, $[I_4]$. For first four labels, 1 stands for the symmetry $[4]$; 2, $[31]$; 3, $[22]$; 4, $[211]$, and for the last one, 1 stands for isospin 2; 2, $\frac{3}{2}$; 3, 1; 4, $\frac{1}{2}$; 5, 0. The row labels are B (baryon index) and M (meson index), where indices B and M are listed in Table A2. The transformation coefficients should be the square root of the entries, and a negative sign means to take the negative square root.

$Y = 2 \quad I = 2 \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$	
B M	
5 7	1

$Y = 2 \quad I = 2 \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$								
B M	12121	21111	22121					
5 2	$-\frac{1}{8}$	$\frac{5}{8}$	$-\frac{1}{4}$					
5 7	$\frac{5}{24}$	$\frac{3}{8}$	$\frac{5}{12}$					
17 17	$-\frac{2}{3}$	0	$\frac{1}{3}$					
$Y = 2 \quad I = 2 \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$								
B M	12121	22121	23131					
5 7	$\frac{1}{3}$	$\frac{2}{3}$	0					
17 12	$-\frac{1}{2}$	$\frac{1}{4}$	$-\frac{1}{4}$					
17 17	$-\frac{1}{6}$	$\frac{1}{12}$	$\frac{3}{4}$					
$Y = 2 \quad I = 1 \quad J = \frac{5}{2} \quad Y_4 = \frac{4}{3}$								
B M	12213 22213							
5 7	$-\frac{1}{3}$	$-\frac{2}{3}$						
13 17	$-\frac{2}{3}$	$\frac{1}{3}$						
$Y = 2 \quad I = 1 \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$								
B M	12223	21223	22223	12213	22213	23223	24223	
1 7	$\frac{1}{9}$	$\frac{2}{3}$	$\frac{2}{9}$	0	0	0	0	
5 2	$-\frac{1}{12}$	$\frac{1}{8}$	$-\frac{1}{6}$	$-\frac{5}{24}$	$-\frac{5}{12}$	0	0	
5 7	$\frac{5}{36}$	$-\frac{5}{24}$	$\frac{5}{18}$	$-\frac{1}{8}$	$-\frac{1}{4}$	0	0	
9 17	$-\frac{4}{9}$	0	$\frac{2}{9}$	0	0	$-\frac{1}{3}$	0	
13 12	$\frac{1}{24}$	0	$-\frac{1}{48}$	$-\frac{5}{12}$	$\frac{5}{24}$	$-\frac{1}{8}$	$-\frac{3}{16}$	
13 17	$-\frac{5}{72}$	0	$\frac{5}{144}$	$-\frac{1}{4}$	$\frac{1}{8}$	$\frac{5}{24}$	$\frac{5}{16}$	
17 17	$\frac{1}{9}$	0	$-\frac{1}{18}$	0	0	$-\frac{1}{3}$	$\frac{1}{2}$	
$Y = 2 \quad I = 1 \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$								
B M	12223	12233	21223	22223	22233	23223	24233	24223
1 2	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	0	0	0
1 7	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{18}$	$\frac{1}{2}$	0	0	0
5 7	$\frac{2}{9}$	0	$-\frac{1}{3}$	$\frac{4}{9}$	0	0	0	0
9 12	$-\frac{1}{3}$	$-\frac{1}{12}$	0	$\frac{1}{6}$	$\frac{1}{24}$	$-\frac{1}{4}$	$-\frac{1}{8}$	0
9 17	$-\frac{1}{9}$	$\frac{1}{4}$	0	$\frac{1}{18}$	$-\frac{1}{8}$	$-\frac{1}{12}$	$\frac{3}{8}$	0
13 17	$-\frac{1}{9}$	0	0	$\frac{1}{18}$	0	$\frac{1}{3}$	0	$\frac{1}{2}$
17 12	$\frac{1}{12}$	$-\frac{1}{12}$	0	$-\frac{1}{24}$	$\frac{1}{24}$	$-\frac{1}{4}$	$\frac{1}{8}$	$\frac{3}{8}$
17 17	$\frac{1}{36}$	$\frac{1}{4}$	0	$-\frac{1}{72}$	$-\frac{1}{8}$	$-\frac{1}{12}$	$-\frac{3}{8}$	$\frac{1}{8}$
$Y = 2 \quad I = 0 \quad J = \frac{5}{2} \quad Y_4 = \frac{4}{3}$								
B M	23315							
13 17	-1							
$Y = 2 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$								
B M	12325	22325	24325	23315				
1 7	$-\frac{1}{3}$	$-\frac{2}{3}$	0	0				
9 17	$-\frac{1}{3}$	$\frac{1}{6}$	$-\frac{1}{2}$	0				
13 12	$-\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{16}$	$-\frac{5}{8}$				
13 17	$\frac{5}{24}$	$-\frac{5}{48}$	$-\frac{5}{16}$	$-\frac{3}{8}$				
$Y = 2 \quad I = 0 \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$								
B M	12325	21335	22325	23335	24325			
1 2	$-\frac{1}{4}$	$\frac{1}{4}$	$-\frac{1}{2}$	0	0			
1 7	$-\frac{1}{12}$	$-\frac{3}{4}$	$-\frac{1}{6}$	0	0			
9 12	$-\frac{1}{4}$	0	$\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{3}{8}$			
9 17	$-\frac{1}{12}$	0	$\frac{1}{24}$	$\frac{3}{4}$	$-\frac{1}{8}$			
13 17	$\frac{1}{3}$	0	$-\frac{1}{6}$	0	$-\frac{1}{2}$			
$Y = 1 \quad I = \frac{5}{2} \quad J = \frac{5}{2} \quad Y_4 = \frac{4}{3}$								
B M	21111							
5 6	-1							
$Y = 1 \quad I = \frac{5}{2} \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$								
B M	12121	21111	22121					
5 1	$\frac{1}{8}$	$-\frac{5}{8}$	$\frac{1}{4}$					
5 6	$-\frac{5}{24}$	$-\frac{3}{8}$	$-\frac{5}{12}$					
17 16	$\frac{2}{3}$	0	$-\frac{1}{3}$					

$Y = 1 \quad I = \frac{5}{2} \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$											
B M	12121	22121	23131								
5 6	$-\frac{1}{3}$	$-\frac{2}{3}$	0								
17 11	$\frac{1}{2}$	$-\frac{1}{4}$	$\frac{1}{4}$								
17 16	$\frac{1}{6}$	$-\frac{1}{12}$	$-\frac{3}{4}$								
$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{5}{2} \quad Y_4 = \frac{4}{3}$											
B M	12213	21111	22213								
5 6	$\frac{5}{24}$	$\frac{3}{8}$	$\frac{5}{12}$								
5 9	$-\frac{1}{8}$	$\frac{5}{8}$	$-\frac{1}{4}$								
13 16	$\frac{2}{3}$	0	$-\frac{1}{3}$								
$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{5}{2} \quad Y_4 = \frac{1}{3}$											
B M	12212	21112	22212								
5 10	$\frac{1}{4}$	$-\frac{1}{4}$	$\frac{1}{2}$								
6 7	$-\frac{1}{12}$	$-\frac{3}{4}$	$-\frac{1}{6}$								
15 17	$\frac{2}{3}$	0	$-\frac{1}{3}$								
$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$											
B M	12223	21223	22223	12121	12213	21111	22121	22213	23223	24223	
1 6	$-\frac{1}{9}$	$-\frac{2}{3}$	$-\frac{2}{9}$	0	0	0	0	0	0	0	
5 1	$\frac{5}{96}$	$-\frac{5}{64}$	$\frac{5}{48}$	$-\frac{3}{64}$	$\frac{25}{192}$	$\frac{15}{64}$	$-\frac{3}{32}$	$\frac{25}{96}$	0	0	
5 5	$-\frac{1}{32}$	$\frac{3}{64}$	$-\frac{1}{16}$	$-\frac{5}{64}$	$-\frac{5}{64}$	$\frac{25}{64}$	$-\frac{5}{32}$	$-\frac{5}{32}$	0	0	
5 6	$-\frac{25}{288}$	$\frac{25}{192}$	$-\frac{25}{144}$	$\frac{5}{64}$	$\frac{5}{64}$	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{5}{32}$	0	0	
5 9	$\frac{5}{96}$	$-\frac{5}{64}$	$\frac{5}{48}$	$\frac{25}{192}$	$-\frac{3}{64}$	$\frac{15}{64}$	$\frac{25}{96}$	$-\frac{3}{32}$	0	0	
9 16	$\frac{4}{9}$	0	$-\frac{2}{9}$	0	0	0	0	0	$\frac{1}{3}$	0	
13 11	$-\frac{1}{24}$	0	$\frac{1}{48}$	0	$\frac{5}{12}$	0	0	$-\frac{5}{24}$	$\frac{1}{8}$	$\frac{3}{16}$	
13 16	$\frac{5}{72}$	0	$-\frac{5}{144}$	0	$\frac{1}{4}$	0	0	$-\frac{1}{8}$	$-\frac{5}{24}$	$-\frac{5}{16}$	
17 16	$-\frac{5}{72}$	0	$\frac{5}{144}$	$-\frac{1}{4}$	0	0	$\frac{1}{8}$	0	$\frac{5}{24}$	$-\frac{5}{16}$	
17 19	$\frac{1}{24}$	0	$-\frac{1}{48}$	$-\frac{5}{12}$	0	0	$\frac{5}{24}$	0	$-\frac{1}{8}$	$\frac{3}{16}$	
$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{3}{2} \quad Y_4 = \frac{1}{3}$											
B M	12222	21222	22222	12122	12212	21112	22122	22212	23222	24222	
3 7	$-\frac{1}{9}$	$-\frac{2}{3}$	$-\frac{2}{9}$	0	0	0	0	0	0	0	
5 4	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{5}{32}$	$-\frac{5}{32}$	$\frac{1}{16}$	$\frac{5}{16}$	0	0	
5 10	$-\frac{5}{48}$	$\frac{5}{32}$	$-\frac{5}{24}$	$-\frac{5}{96}$	$\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{5}{48}$	$\frac{3}{16}$	0	0	
6 2	$-\frac{1}{48}$	$\frac{1}{32}$	$-\frac{1}{24}$	$\frac{3}{32}$	$-\frac{5}{96}$	$-\frac{15}{32}$	$\frac{3}{16}$	$-\frac{5}{48}$	0	0	
6 7	$\frac{5}{144}$	$-\frac{5}{96}$	$\frac{5}{72}$	$-\frac{5}{32}$	$-\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{5}{16}$	$-\frac{1}{16}$	0	0	
11 17	$\frac{4}{9}$	0	$-\frac{2}{9}$	0	0	0	0	0	$\frac{1}{3}$	0	
15 12	$-\frac{1}{24}$	0	$\frac{1}{48}$	0	$\frac{5}{12}$	0	0	$-\frac{5}{24}$	$\frac{1}{8}$	$\frac{3}{16}$	
15 17	$\frac{5}{72}$	0	$-\frac{5}{144}$	0	$\frac{1}{4}$	0	0	$-\frac{1}{8}$	$-\frac{5}{24}$	$-\frac{5}{16}$	
17 20	$-\frac{1}{12}$	0	$\frac{1}{24}$	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	0	$\frac{1}{4}$	$-\frac{3}{8}$	
18 17	$\frac{1}{36}$	0	$-\frac{1}{72}$	$\frac{1}{2}$	0	0	$-\frac{1}{4}$	0	$-\frac{1}{12}$	$\frac{1}{8}$	
$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$											
B M	12223	12233	21223	22223	22233	12121	22121	23223	24233	24223	23131
1 1	$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$\frac{1}{6}$	0	0	0	0	0	0
1 6	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{6}$	$-\frac{1}{18}$	$-\frac{1}{2}$	0	0	0	0	0	0
5 6	$-\frac{5}{36}$	0	$\frac{5}{24}$	$-\frac{5}{18}$	0	$\frac{1}{8}$	$\frac{1}{4}$	0	0	0	0
5 9	$\frac{1}{12}$	0	$-\frac{1}{8}$	$\frac{1}{6}$	0	$\frac{5}{24}$	$\frac{5}{12}$	0	0	0	0
9 11	$\frac{1}{3}$	$\frac{1}{12}$	0	$-\frac{1}{6}$	$-\frac{1}{24}$	0	0	$\frac{1}{4}$	$\frac{1}{8}$	0	0
9 16	$\frac{1}{9}$	$-\frac{1}{4}$	0	$-\frac{1}{18}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$-\frac{3}{8}$	0	0
13 16	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	$-\frac{1}{2}$	0
17 11	$-\frac{5}{96}$	$\frac{5}{96}$	0	$\frac{5}{192}$	$-\frac{5}{192}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{5}{32}$	$-\frac{5}{64}$	$-\frac{15}{64}$	$-\frac{3}{32}$
17 15	$\frac{1}{32}$	$-\frac{1}{32}$	0	$-\frac{1}{64}$	$\frac{1}{64}$	$-\frac{5}{16}$	$\frac{5}{32}$	$-\frac{3}{32}$	$\frac{3}{64}$	$\frac{9}{64}$	$-\frac{5}{32}$
17 16	$-\frac{5}{288}$	$-\frac{5}{32}$	0	$\frac{5}{576}$	$\frac{5}{64}$	$-\frac{1}{16}$	$\frac{1}{32}$	$\frac{5}{96}$	$\frac{15}{64}$	$-\frac{5}{64}$	$\frac{9}{32}$
17 19	$\frac{1}{96}$	$\frac{3}{32}$	0	$-\frac{1}{192}$	$-\frac{3}{64}$	$-\frac{5}{48}$	$\frac{5}{96}$	$-\frac{1}{32}$	$-\frac{9}{64}$	$\frac{3}{64}$	$\frac{15}{32}$

$Y = 1 \quad I = \frac{3}{2} \quad J = \frac{1}{2} \quad Y_4 = \frac{1}{3}$											
B M	12222	12232	21222	22222	22232	12122	22122	23222	24232	24222	23132
3 2	$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$\frac{1}{6}$	0	0	0	0	0	0
3 7	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{6}$	$-\frac{1}{18}$	$-\frac{1}{2}$	0	0	0	0	0	0
5 10	$-\frac{1}{6}$	0	$\frac{1}{4}$	$-\frac{1}{3}$	0	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0
6 7	$\frac{1}{18}$	0	$-\frac{1}{12}$	$\frac{1}{9}$	0	$-\frac{1}{4}$	$-\frac{1}{2}$	0	0	0	0
11 12	$\frac{1}{3}$	$\frac{1}{12}$	0	$-\frac{1}{6}$	$-\frac{1}{24}$	0	0	$\frac{1}{4}$	$\frac{1}{8}$	0	0
11 17	$\frac{1}{9}$	$-\frac{1}{4}$	0	$-\frac{1}{18}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$-\frac{3}{8}$	0	0
15 17	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	$-\frac{1}{2}$	0
17 14	$-\frac{1}{16}$	$\frac{1}{16}$	0	$\frac{3}{32}$	$-\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{3}{16}$	$-\frac{3}{32}$	$-\frac{9}{32}$	$\frac{1}{16}$
17 20	$-\frac{1}{48}$	$-\frac{3}{16}$	0	$\frac{1}{96}$	$\frac{3}{32}$	$\frac{1}{24}$	$-\frac{1}{48}$	$\frac{1}{16}$	$\frac{9}{32}$	$-\frac{3}{32}$	$-\frac{3}{16}$
18 12	$\frac{1}{48}$	$-\frac{1}{48}$	0	$-\frac{1}{96}$	$\frac{1}{96}$	$\frac{3}{8}$	$-\frac{3}{16}$	$-\frac{1}{16}$	$\frac{1}{32}$	$\frac{3}{32}$	$\frac{3}{16}$
18 17	$\frac{1}{144}$	$\frac{1}{16}$	0	$-\frac{1}{288}$	$-\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{1}{48}$	$-\frac{3}{32}$	$\frac{1}{32}$	$-\frac{9}{16}$

$$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{5}{2} \quad Y_4 = \frac{4}{3}$$

B M	12213	22213	23315
5 6	$-\frac{1}{3}$	$-\frac{2}{3}$	0
13 16	$-\frac{1}{6}$	$\frac{1}{12}$	$\frac{3}{4}$
13 19	$-\frac{1}{2}$	$\frac{1}{4}$	$-\frac{1}{4}$

$$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{5}{2} \quad Y_4 = \frac{1}{3}$$

B M	12214	22214	23314	24414
6 7	$\frac{1}{3}$	$\frac{2}{3}$	0	0
13 20	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{4}$	$-\frac{3}{8}$
14 17	$\frac{3}{8}$	$-\frac{3}{16}$	$-\frac{3}{8}$	$\frac{1}{16}$
15 17	$\frac{1}{24}$	$-\frac{1}{48}$	$\frac{3}{8}$	$\frac{9}{16}$

$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{3}{2} \quad Y_4 = \frac{4}{3}$											
B M	12223	12325	21223	22223	22325	12213	22213	23223	24325	23315	24223
1 6	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{18}$	$\frac{1}{2}$	0	0	0	0	0	0
1 9	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	0	0	0	0	0	0
5 1	$-\frac{1}{12}$	0	$\frac{1}{8}$	$-\frac{1}{6}$	0	$-\frac{5}{24}$	$-\frac{5}{12}$	0	0	0	0
5 6	$\frac{5}{36}$	0	$-\frac{5}{24}$	$\frac{5}{18}$	0	$-\frac{1}{8}$	$-\frac{1}{4}$	0	0	0	0
9 16	$-\frac{1}{9}$	$\frac{1}{4}$	0	$\frac{1}{18}$	$-\frac{1}{8}$	0	0	$-\frac{1}{12}$	$\frac{3}{8}$	0	0
9 19	$-\frac{1}{3}$	$-\frac{1}{12}$	0	$\frac{1}{6}$	$\frac{1}{24}$	0	0	$-\frac{1}{4}$	$-\frac{1}{8}$	0	0
13 11	$\frac{1}{96}$	$\frac{3}{32}$	0	$-\frac{1}{192}$	$-\frac{3}{64}$	$-\frac{5}{48}$	$\frac{5}{96}$	$-\frac{1}{32}$	$-\frac{9}{64}$	$\frac{15}{32}$	$-\frac{3}{64}$
13 15	$\frac{1}{32}$	$-\frac{1}{32}$	0	$-\frac{1}{64}$	$\frac{1}{64}$	$-\frac{5}{16}$	$\frac{5}{32}$	$-\frac{3}{32}$	$\frac{3}{64}$	$-\frac{5}{32}$	$-\frac{9}{64}$
13 16	$-\frac{5}{288}$	$-\frac{5}{32}$	0	$\frac{5}{576}$	$\frac{5}{64}$	$-\frac{1}{16}$	$\frac{1}{32}$	$\frac{5}{96}$	$\frac{15}{64}$	$\frac{9}{32}$	$\frac{5}{64}$
13 19	$-\frac{5}{96}$	$\frac{5}{96}$	0	$\frac{5}{192}$	$-\frac{5}{192}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{5}{32}$	$-\frac{5}{64}$	$-\frac{3}{32}$	$\frac{15}{64}$
17 16	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	0	$\frac{1}{2}$

$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{3}{2} \quad Y_4 = \frac{1}{3}$															
B M	12224	12324	12424	21224	22224	22324	22424	12214	22214	23224	23424	24324	24424	23314	24224
1 10	$-\frac{1}{24}$	$\frac{1}{12}$	$\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{1}{12}$	$\frac{1}{6}$	$\frac{1}{4}$	0	0	0	0	0	0	0	0
2 7	$-\frac{1}{16}$	$-\frac{1}{8}$	$-\frac{1}{48}$	$-\frac{3}{8}$	$-\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{1}{24}$	0	0	0	0	0	0	0	0
3 7	$-\frac{1}{144}$	$\frac{1}{8}$	$-\frac{3}{16}$	$-\frac{1}{24}$	$-\frac{1}{72}$	$\frac{1}{4}$	$-\frac{3}{8}$	0	0	0	0	0	0	0	0
6 2	$\frac{1}{12}$	0	0	$-\frac{1}{8}$	$\frac{1}{6}$	0	0	$\frac{5}{24}$	$\frac{5}{12}$	0	0	0	0	0	0
6 7	$-\frac{5}{36}$	0	0	$\frac{5}{24}$	$-\frac{5}{18}$	0	0	$\frac{1}{8}$	$\frac{1}{4}$	0	0	0	0	0	0
9 20	$\frac{1}{6}$	$\frac{1}{12}$	0	0	$-\frac{1}{12}$	$-\frac{1}{24}$	0	0	0	$\frac{1}{8}$	$-\frac{1}{8}$	$\frac{1}{8}$	$-\frac{1}{4}$	0	0
10 17	$\frac{1}{4}$	$-\frac{1}{8}$	0	0	$-\frac{1}{8}$	$\frac{1}{16}$	0	0	0	$\frac{3}{16}$	$\frac{1}{48}$	$-\frac{3}{16}$	$\frac{1}{24}$	0	0
11 17	$\frac{1}{36}$	$\frac{1}{8}$	0	0	$-\frac{1}{72}$	$-\frac{1}{16}$	0	0	0	$\frac{1}{48}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{8}$	0	0
13 14	$-\frac{1}{64}$	$\frac{1}{32}$	$-\frac{3}{64}$	0	$\frac{1}{128}$	$-\frac{1}{64}$	$\frac{3}{128}$	$\frac{5}{32}$	$-\frac{5}{64}$	$\frac{3}{64}$	$\frac{3}{64}$	$-\frac{3}{64}$	$-\frac{3}{128}$	$\frac{5}{32}$	$\frac{9}{128}$
13 20	$\frac{5}{192}$	$-\frac{5}{96}$	$\frac{5}{64}$	0	$-\frac{5}{384}$	$\frac{5}{192}$	$-\frac{5}{128}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{5}{64}$	$-\frac{5}{64}$	$\frac{5}{128}$	$\frac{3}{32}$	$-\frac{15}{128}$	$-\frac{9}{64}$
14 12	$-\frac{3}{128}$	$-\frac{3}{64}$	$\frac{1}{128}$	0	$\frac{3}{256}$	$\frac{3}{128}$	$-\frac{1}{256}$	$\frac{15}{64}$	$-\frac{15}{128}$	$\frac{9}{128}$	$-\frac{1}{128}$	$\frac{9}{128}$	$-\frac{15}{256}$	$-\frac{15}{64}$	$\frac{27}{128}$
14 17	$\frac{5}{128}$	$\frac{5}{64}$	$-\frac{5}{384}$	0	$-\frac{5}{256}$	$-\frac{5}{128}$	$\frac{5}{768}$	$\frac{9}{64}$	$-\frac{9}{128}$	$-\frac{15}{128}$	$\frac{5}{384}$	$-\frac{15}{128}$	$-\frac{5}{768}$	$-\frac{9}{64}$	$-\frac{45}{256}$
15 12	$-\frac{1}{384}$	$\frac{3}{64}$	$\frac{9}{128}$	0	$\frac{1}{768}$	$-\frac{3}{128}$	$-\frac{9}{256}$	$\frac{5}{192}$	$-\frac{5}{384}$	$\frac{1}{128}$	$-\frac{9}{128}$	$-\frac{9}{128}$	$\frac{9}{256}$	$\frac{15}{64}$	$\frac{3}{256}$
15 17	$\frac{5}{1152}$	$-\frac{5}{64}$	$-\frac{15}{128}$	0	$-\frac{5}{2304}$	$\frac{5}{128}$	$\frac{15}{256}$	$\frac{1}{64}$	$-\frac{1}{128}$	$-\frac{5}{384}$	$\frac{15}{128}$	$\frac{15}{128}$	$-\frac{15}{256}$	$\frac{9}{64}$	$-\frac{5}{256}$
18 17	$-\frac{1}{9}$	0	0	0	$\frac{1}{18}$	0	0	0	0	$\frac{1}{3}$	0	0	0	0	$-\frac{1}{2}$
21 17	0	0	$\frac{1}{3}$	0	0	0	$-\frac{1}{6}$	0	0	0	$\frac{1}{3}$	0	$-\frac{1}{6}$	0	0

$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{1}{2} \quad Y_4 = \frac{4}{3}$																
B M	12223	12233	12325	21223	21335	22223	22233	22325	23223	23335	24233	24325	24223			
1 1	$\frac{1}{48}$	$-\frac{1}{48}$	$\frac{3}{16}$	$\frac{1}{8}$	$-\frac{3}{16}$	$\frac{1}{24}$	$-\frac{1}{24}$	$\frac{3}{8}$	0	0	0	0	0			
1 5	$\frac{1}{16}$	$-\frac{1}{16}$	$-\frac{1}{16}$	$\frac{3}{8}$	$\frac{1}{16}$	$\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{1}{8}$	0	0	0	0	0			
1 6	$\frac{1}{144}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{24}$	$\frac{9}{16}$	$\frac{1}{72}$	$\frac{1}{8}$	$\frac{1}{8}$	0	0	0	0	0			
1 9	$\frac{1}{48}$	$\frac{3}{16}$	$-\frac{1}{48}$	$\frac{1}{8}$	$-\frac{3}{16}$	$\frac{1}{24}$	$\frac{3}{8}$	$-\frac{1}{24}$	0	0	0	0	0			
5 6	$\frac{2}{9}$	0	0	$-\frac{1}{3}$	0	$\frac{4}{9}$	0	0	0	0	0	0	0			
9 11	$-\frac{1}{12}$	$-\frac{1}{48}$	$\frac{3}{16}$	0	0	$\frac{1}{24}$	$\frac{1}{96}$	$-\frac{3}{32}$	$-\frac{1}{16}$	$\frac{3}{16}$	$-\frac{1}{32}$	$\frac{9}{32}$	0			
9 15	$-\frac{1}{4}$	$-\frac{1}{16}$	$-\frac{1}{16}$	0	0	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{32}$	$-\frac{3}{16}$	$-\frac{1}{16}$	$-\frac{3}{32}$	$-\frac{3}{32}$	0			
9 16	$-\frac{1}{36}$	$\frac{1}{16}$	$\frac{1}{16}$	0	0	$\frac{1}{72}$	$-\frac{1}{32}$	$-\frac{1}{32}$	$-\frac{1}{48}$	$-\frac{9}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	0			
9 19	$-\frac{1}{12}$	$\frac{3}{16}$	$-\frac{1}{48}$	0	0	$\frac{1}{24}$	$-\frac{3}{32}$	$\frac{1}{96}$	$-\frac{1}{16}$	$\frac{3}{16}$	$\frac{9}{32}$	$-\frac{1}{32}$	0			
13 16	$-\frac{1}{36}$	0	$-\frac{1}{4}$	0	0	$\frac{1}{72}$	0	$\frac{1}{8}$	$\frac{1}{12}$	0	0	$\frac{3}{8}$	$\frac{1}{8}$			
13 19	$-\frac{1}{12}$	0	$\frac{1}{12}$	0	0	$\frac{1}{24}$	0	$-\frac{1}{24}$	$\frac{1}{4}$	0	0	$-\frac{1}{8}$	$\frac{3}{8}$			
17 11	$\frac{1}{12}$	$-\frac{1}{12}$	0	0	0	$-\frac{1}{24}$	$\frac{1}{24}$	0	$-\frac{1}{4}$	0	$\frac{1}{8}$	0	$\frac{3}{8}$			
17 16	$\frac{1}{36}$	$\frac{1}{4}$	0	0	0	$-\frac{1}{72}$	$-\frac{1}{8}$	0	$-\frac{1}{12}$	0	$-\frac{3}{8}$	0	$\frac{1}{8}$			
$Y = 1 \quad I = \frac{1}{2} \quad J = \frac{1}{2} \quad Y_4 = \frac{1}{3}$																
B M	12224	12234	12324	12424	12434	21224	21334	22224	22234	22324	22424	22434	23224	23334	23424	24234
1 4	$-\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{3}{32}$	$-\frac{1}{16}$	$-\frac{1}{16}$	$-\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	0	0	0	0
1 10	$-\frac{1}{96}$	$-\frac{3}{32}$	$\frac{1}{48}$	$\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{1}{16}$	$\frac{3}{16}$	$-\frac{1}{48}$	$-\frac{3}{16}$	$\frac{1}{24}$	$\frac{1}{16}$	$-\frac{3}{16}$	0	0	0	0
2 2	$-\frac{3}{64}$	$\frac{3}{64}$	$-\frac{3}{32}$	$-\frac{1}{64}$	$-\frac{1}{192}$	$-\frac{3}{32}$	$\frac{3}{32}$	$-\frac{3}{32}$	$\frac{3}{32}$	$-\frac{3}{16}$	$-\frac{1}{32}$	$-\frac{1}{96}$	0	0	0	0
2 7	$-\frac{1}{64}$	$-\frac{9}{64}$	$-\frac{1}{32}$	$-\frac{1}{192}$	$\frac{1}{64}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{1}{16}$	$-\frac{1}{96}$	$\frac{1}{32}$	0	0	0	0
3 2	$-\frac{1}{192}$	$\frac{1}{192}$	$\frac{3}{32}$	$-\frac{9}{64}$	$-\frac{3}{64}$	$-\frac{1}{32}$	$-\frac{3}{32}$	$-\frac{1}{96}$	$\frac{1}{96}$	$\frac{3}{16}$	$-\frac{9}{32}$	$-\frac{3}{32}$	0	0	0	0
3 7	$-\frac{1}{576}$	$-\frac{1}{64}$	$\frac{3}{32}$	$-\frac{9}{64}$	$\frac{9}{64}$	$-\frac{1}{96}$	$\frac{9}{32}$	$-\frac{1}{288}$	$-\frac{1}{32}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{9}{32}$	0	0	0	0
6 7	$-\frac{2}{9}$	0	0	0	0	$\frac{1}{3}$	0	$-\frac{4}{9}$	0	0	0	0	0	0	0	0
9 14	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{16}$	0	$-\frac{1}{32}$	0	0	$-\frac{1}{16}$	$-\frac{1}{64}$	$-\frac{1}{32}$	0	$\frac{1}{64}$	$\frac{3}{32}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{3}{64}$
9 20	$\frac{1}{24}$	$-\frac{3}{32}$	$\frac{1}{48}$	0	$\frac{3}{32}$	0	0	$-\frac{1}{48}$	$\frac{3}{64}$	$-\frac{1}{96}$	0	$-\frac{3}{64}$	$\frac{1}{32}$	$-\frac{3}{16}$	$-\frac{1}{32}$	$-\frac{9}{64}$
10 12	$\frac{3}{16}$	$\frac{3}{64}$	$-\frac{3}{32}$	0	$\frac{1}{192}$	0	0	$-\frac{3}{32}$	$-\frac{3}{128}$	$\frac{3}{64}$	0	$-\frac{1}{384}$	$\frac{9}{64}$	$-\frac{3}{32}$	$\frac{1}{64}$	$\frac{9}{128}$
10 17	$\frac{1}{16}$	$-\frac{9}{64}$	$-\frac{1}{32}$	0	$-\frac{1}{64}$	0	0	$-\frac{1}{32}$	$\frac{9}{128}$	$\frac{1}{64}$	0	$\frac{1}{128}$	$\frac{3}{64}$	$\frac{9}{32}$	$\frac{1}{192}$	$-\frac{27}{128}$
11 12	$\frac{1}{48}$	$\frac{1}{192}$	$\frac{3}{32}$	0	$\frac{3}{64}$	0	0	$-\frac{1}{96}$	$-\frac{1}{384}$	$-\frac{3}{64}$	0	$-\frac{3}{128}$	$\frac{1}{64}$	$\frac{3}{32}$	$\frac{9}{64}$	$\frac{1}{128}$
11 17	$\frac{1}{144}$	$-\frac{1}{64}$	$\frac{1}{32}$	0	$-\frac{9}{64}$	0	0	$-\frac{1}{288}$	$\frac{1}{128}$	$-\frac{1}{64}$	0	$\frac{9}{128}$	$\frac{1}{192}$	$-\frac{9}{32}$	$\frac{3}{64}$	$-\frac{3}{128}$
13 20	$\frac{1}{24}$	0	$-\frac{1}{12}$	$\frac{1}{8}$	0	0	0	$-\frac{1}{48}$	0	$\frac{1}{24}$	$-\frac{1}{16}$	0	$-\frac{1}{8}$	0	$-\frac{1}{8}$	0
14 17	$\frac{1}{16}$	0	$\frac{1}{8}$	$-\frac{1}{48}$	0	0	0	$-\frac{1}{32}$	0	$-\frac{1}{16}$	$\frac{1}{96}$	0	$-\frac{3}{16}$	0	$\frac{1}{48}$	0
15 17	$\frac{1}{144}$	0	$-\frac{1}{8}$	$-\frac{3}{16}$	0	0	0	$-\frac{1}{288}$	0	$\frac{1}{16}$	$\frac{3}{32}$	0	$-\frac{1}{48}$	0	$\frac{3}{16}$	0
18 12	$-\frac{1}{12}$	$\frac{1}{12}$	0	0	0	0	0	$\frac{1}{24}$	$-\frac{1}{24}$	0	0	0	$\frac{1}{4}$	0	0	$-\frac{1}{8}$
18 17	$-\frac{1}{36}$	$-\frac{1}{4}$	0	0	0	0	0	$\frac{1}{72}$	$\frac{1}{8}$	0	0	0	$\frac{1}{12}$	0	0	$\frac{3}{8}$
21 12	0	0	0	$\frac{1}{4}$	$-\frac{1}{12}$	0	0	0	0	0	$-\frac{1}{8}$	$\frac{1}{24}$	0	0	$\frac{1}{4}$	0
21 17	0	0	0	$\frac{1}{12}$	$\frac{1}{4}$	0	0	0	0	0	$-\frac{1}{24}$	$-\frac{1}{8}$	0	0	$\frac{1}{12}$	0
B M	24324	24424	24434	24224												
1 4	0	0	0	0												
1 10	0	0	0	0												
2 2	0	0	0	0												
2 7	0	0	0	0												
3 2	0	0	0	0												
3 7	0	0	0	0												
6 7	0	0	0	0												
9 14	$\frac{3}{32}$	$-\frac{3}{16}$	$-\frac{3}{64}$	0												
9 20	$\frac{1}{32}$	$-\frac{1}{16}$	$\frac{9}{64}$	0												
10 12	$-\frac{9}{64}$	$\frac{1}{32}$	$\frac{1}{128}$	0												
10 17	$-\frac{3}{64}$	$\frac{1}{96}$	$-\frac{3}{128}$	0												
11 12	$\frac{9}{64}$	$\frac{9}{32}$	$\frac{9}{128}$	0												
11 17	$\frac{3}{64}$	$\frac{3}{32}$	$-\frac{27}{128}$	0												
13 20	$\frac{1}{8}$	$\frac{1}{16}$	0	$-\frac{3}{16}$												
14 17	$-\frac{3}{16}$	$-\frac{1}{96}$	0	$-\frac{9}{32}$												
15 17	$\frac{3}{16}$	$-\frac{3}{32}$	0	$-\frac{1}{32}$												
18 12	0	0	0	$-\frac{3}{8}$												
18 17	0	0	0	$-\frac{1}{8}$												
21 12	0	$-\frac{1}{8}$	$\frac{1}{8}$	0												
21 17	0	$-\frac{1}{24}$	$-\frac{3}{8}$	0												

$Y = 0 \quad I = 2 \quad J = \frac{5}{2} \quad Y_4 = \frac{1}{3}$			
B M	12212	21112	22212
5 8	$-\frac{1}{4}$	$\frac{1}{4}$	$-\frac{1}{2}$
6 6	$\frac{1}{12}$	$\frac{3}{4}$	$\frac{1}{6}$
15 16	$-\frac{2}{3}$	0	$\frac{1}{3}$

$Y = 0 \quad I = 2 \quad J = \frac{3}{2} \quad Y_4 = \frac{1}{3}$										
B M	12222	21222	22222	12122	12212	21112	22122	22212	23222	24222
3 6	$\frac{1}{9}$	$\frac{2}{3}$	$\frac{2}{9}$	0	0	0	0	0	0	0
5 3	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{1}{8}$	$-\frac{1}{32}$	$-\frac{5}{32}$	$\frac{5}{32}$	$-\frac{1}{16}$	$-\frac{5}{16}$	0	0
5 8	$\frac{5}{48}$	$-\frac{5}{32}$	$\frac{5}{24}$	$\frac{5}{96}$	$-\frac{3}{32}$	$\frac{3}{32}$	$\frac{5}{48}$	$-\frac{3}{16}$	0	0
6 1	$\frac{1}{48}$	$-\frac{1}{32}$	$\frac{1}{24}$	$-\frac{3}{32}$	$\frac{5}{96}$	$\frac{15}{32}$	$-\frac{3}{16}$	$\frac{5}{48}$	0	0
6 6	$-\frac{5}{144}$	$\frac{5}{96}$	$-\frac{5}{72}$	$\frac{5}{32}$	$\frac{1}{32}$	$\frac{9}{32}$	$\frac{5}{16}$	$\frac{1}{16}$	0	0
11 16	$-\frac{4}{9}$	0	$\frac{2}{9}$	0	0	0	0	0	$-\frac{1}{3}$	0
15 11	$\frac{1}{24}$	0	$-\frac{1}{48}$	0	$-\frac{5}{12}$	0	0	$\frac{5}{24}$	$-\frac{1}{8}$	$-\frac{3}{16}$
15 16	$-\frac{5}{72}$	0	$\frac{5}{144}$	0	$-\frac{1}{4}$	0	0	$\frac{1}{8}$	$\frac{5}{24}$	$\frac{5}{16}$
17 18	$\frac{1}{12}$	0	$-\frac{1}{24}$	$-\frac{1}{6}$	0	0	$\frac{1}{12}$	0	$-\frac{1}{4}$	$\frac{3}{8}$
18 16	$-\frac{1}{36}$	0	$\frac{1}{72}$	$-\frac{1}{2}$	0	0	$\frac{1}{4}$	0	$\frac{1}{12}$	$-\frac{1}{8}$

$Y = 0 \quad I = 2 \quad J = \frac{1}{2} \quad Y_4 = \frac{1}{3}$											
B M	12222	12232	21222	22222	22232	12122	22122	23222	24232	24222	23132
3 1	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	0	0	0	0	0	0
3 6	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{18}$	$\frac{1}{2}$	0	0	0	0	0	0
5 8	$\frac{1}{6}$	0	$-\frac{1}{4}$	$\frac{1}{3}$	0	$\frac{1}{12}$	$\frac{1}{6}$	0	0	0	0
6 6	$-\frac{1}{18}$	0	$\frac{1}{12}$	$-\frac{1}{9}$	0	$\frac{1}{4}$	$\frac{1}{2}$	0	0	0	0
11 11	$-\frac{1}{3}$	$-\frac{1}{12}$	0	$\frac{1}{6}$	$\frac{1}{24}$	0	0	$-\frac{1}{4}$	$-\frac{1}{8}$	0	0
11 16	$-\frac{1}{9}$	$\frac{1}{4}$	0	$\frac{1}{18}$	$-\frac{1}{8}$	0	0	$-\frac{1}{12}$	$\frac{3}{8}$	0	0
15 16	$-\frac{1}{9}$	0	0	$\frac{1}{18}$	0	0	0	$\frac{1}{3}$	0	$\frac{1}{2}$	0
17 13	$\frac{1}{16}$	$-\frac{1}{16}$	0	$-\frac{1}{32}$	$\frac{1}{32}$	$-\frac{1}{8}$	$\frac{1}{16}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{9}{32}$	$-\frac{1}{16}$
17 18	$\frac{1}{48}$	$\frac{3}{16}$	0	$-\frac{1}{96}$	$-\frac{3}{32}$	$-\frac{1}{24}$	$\frac{1}{48}$	$-\frac{1}{16}$	$-\frac{9}{32}$	$\frac{3}{32}$	$\frac{3}{16}$
18 11	$-\frac{1}{48}$	$\frac{1}{48}$	0	$\frac{1}{96}$	$-\frac{1}{96}$	$-\frac{3}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	$-\frac{1}{32}$	$-\frac{3}{32}$	$-\frac{3}{16}$
18 16	$-\frac{1}{144}$	$-\frac{1}{16}$	0	$\frac{1}{288}$	$\frac{1}{32}$	$-\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{48}$	$\frac{3}{32}$	$-\frac{1}{32}$	$\frac{9}{16}$

$Y = 0 \quad I = 1 \quad J = \frac{5}{2} \quad Y_4 = \frac{1}{3}$							
B M	12212	21112	22212	12214	22214	23314	24414
5 8	$\frac{1}{4}$	$-\frac{1}{4}$	$\frac{1}{2}$	0	0	0	0
6 6	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{18}$	$-\frac{2}{9}$	$-\frac{4}{9}$	0	0
6 9	$-\frac{1}{18}$	$-\frac{1}{2}$	$-\frac{1}{9}$	$\frac{1}{9}$	$\frac{2}{9}$	0	0
13 18	0	0	0	$-\frac{1}{4}$	$\frac{1}{8}$	$-\frac{1}{4}$	$\frac{3}{8}$
14 16	0	0	0	$-\frac{3}{8}$	$\frac{3}{16}$	$\frac{3}{8}$	$-\frac{1}{16}$
15 16	$\frac{2}{9}$	0	$-\frac{1}{9}$	$-\frac{1}{36}$	$\frac{1}{72}$	$-\frac{1}{4}$	$-\frac{3}{8}$
15 19	$\frac{4}{9}$	0	$-\frac{2}{9}$	$\frac{1}{72}$	$-\frac{1}{144}$	$\frac{1}{8}$	$\frac{3}{16}$

$Y = 0 \quad I = 1 \quad J = \frac{5}{2} \quad Y_4 = -\frac{2}{3}$				
B M	12213	21113	22213	23313
6 10	$-\frac{1}{6}$	$\frac{1}{2}$	$-\frac{1}{3}$	0
7 7	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$	0
15 20	$-\frac{1}{3}$	0	$\frac{1}{6}$	$\frac{1}{2}$
16 17	$-\frac{1}{3}$	0	$\frac{1}{6}$	$-\frac{1}{2}$

		$Y = 0 \quad I = 1 \quad J = \frac{3}{2} \quad Y_4 = \frac{1}{3}$															
B M		12224	12324	12424	21224	22224	22324	22424	12222	21222	22222	12122	12212	21112	22122	22212	12214
1 8		$\frac{1}{24}$	$-\frac{1}{12}$	$-\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{12}$	$-\frac{1}{6}$	$-\frac{1}{4}$	0	0	0	0	0	0	0	0	0
2 6		$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{48}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{24}$	0	0	0	0	0	0	0	0	0
3 6		$\frac{1}{216}$	$-\frac{1}{12}$	$\frac{1}{8}$	$\frac{1}{36}$	$\frac{1}{108}$	$-\frac{1}{6}$	$\frac{1}{4}$	$-\frac{2}{27}$	$-\frac{2}{9}$	$-\frac{2}{27}$	0	0	0	0	0	0
3 9		$-\frac{1}{432}$	$\frac{1}{24}$	$-\frac{1}{16}$	$-\frac{1}{72}$	$-\frac{1}{216}$	$\frac{1}{12}$	$-\frac{1}{8}$	$-\frac{2}{27}$	$-\frac{4}{9}$	$-\frac{4}{27}$	0	0	0	0	0	0
5 3		0	0	0	0	0	0	0	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{5}{32}$	$-\frac{5}{32}$	$\frac{1}{16}$	$\frac{5}{16}$	0
5 8		0	0	0	0	0	0	0	$-\frac{5}{48}$	$\frac{5}{32}$	$-\frac{5}{24}$	$-\frac{5}{96}$	$\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{5}{48}$	$\frac{3}{16}$	0
6 1		$-\frac{1}{18}$	0	0	$\frac{1}{12}$	$-\frac{1}{9}$	0	0	$-\frac{1}{144}$	$\frac{1}{96}$	$-\frac{1}{72}$	$\frac{1}{32}$	$-\frac{5}{288}$	$-\frac{5}{32}$	$\frac{1}{16}$	$-\frac{5}{144}$	$-\frac{5}{36}$
6 5		$\frac{1}{36}$	0	0	$-\frac{1}{24}$	$\frac{1}{18}$	0	0	$-\frac{1}{72}$	$\frac{1}{48}$	$-\frac{1}{36}$	$\frac{1}{16}$	$-\frac{5}{144}$	$-\frac{5}{16}$	$\frac{1}{8}$	$-\frac{5}{72}$	$\frac{5}{72}$
6 6		$\frac{5}{54}$	0	0	$-\frac{5}{36}$	$\frac{5}{27}$	0	0	$\frac{5}{432}$	$-\frac{5}{288}$	$\frac{5}{216}$	$-\frac{5}{96}$	$-\frac{1}{96}$	$-\frac{3}{32}$	$-\frac{5}{48}$	$-\frac{1}{48}$	$-\frac{1}{12}$
6 9		$-\frac{5}{108}$	0	0	$\frac{5}{72}$	$-\frac{5}{54}$	0	0	$\frac{5}{216}$	$-\frac{5}{144}$	$\frac{5}{108}$	$-\frac{5}{48}$	$-\frac{1}{48}$	$-\frac{3}{16}$	$-\frac{5}{24}$	$-\frac{1}{24}$	$\frac{1}{24}$
9 18		$-\frac{1}{6}$	$-\frac{1}{12}$	0	0	$\frac{1}{12}$	$\frac{1}{24}$	0	0	0	0	0	0	0	0	0	0
10 16		$-\frac{1}{4}$	$\frac{1}{8}$	0	0	$\frac{1}{8}$	$-\frac{1}{16}$	0	0	0	0	0	0	0	0	0	0
11 16		$-\frac{1}{54}$	$-\frac{1}{12}$	0	0	$\frac{1}{108}$	$\frac{1}{24}$	0	$\frac{4}{27}$	0	$-\frac{2}{27}$	0	0	0	0	0	0
11 19		$\frac{1}{108}$	$\frac{1}{24}$	0	0	$-\frac{1}{216}$	$-\frac{1}{48}$	0	$\frac{8}{27}$	0	$-\frac{4}{27}$	0	0	0	0	0	0
13 13		$\frac{1}{64}$	$-\frac{1}{32}$	$\frac{3}{64}$	0	$-\frac{1}{128}$	$\frac{1}{64}$	$-\frac{3}{128}$	0	0	0	0	0	0	0	0	$-\frac{5}{32}$
13 18		$-\frac{5}{192}$	$\frac{5}{96}$	$-\frac{5}{64}$	0	$\frac{5}{384}$	$-\frac{5}{192}$	$\frac{5}{128}$	0	0	0	0	0	0	0	0	$-\frac{3}{32}$
14 11		$\frac{3}{128}$	$\frac{3}{64}$	$-\frac{1}{128}$	0	$-\frac{3}{256}$	$-\frac{3}{128}$	$\frac{1}{256}$	0	0	0	0	0	0	0	0	$-\frac{15}{64}$
14 16		$-\frac{5}{128}$	$-\frac{5}{64}$	$\frac{5}{384}$	0	$\frac{5}{256}$	$\frac{5}{128}$	$-\frac{5}{768}$	0	0	0	0	0	0	0	0	$-\frac{9}{64}$
15 11		$\frac{5}{576}$	$-\frac{1}{32}$	$-\frac{3}{64}$	0	$-\frac{1}{1152}$	$\frac{1}{64}$	$\frac{1}{128}$	$-\frac{1}{72}$	0	$\frac{1}{144}$	0	$\frac{5}{36}$	0	0	$-\frac{5}{72}$	$-\frac{5}{288}$
15 15		$-\frac{1}{1152}$	$\frac{1}{64}$	$\frac{3}{128}$	0	$\frac{1}{2304}$	$-\frac{1}{128}$	$-\frac{3}{256}$	$-\frac{1}{36}$	0	$\frac{1}{72}$	0	$\frac{5}{18}$	0	0	$-\frac{5}{36}$	$\frac{5}{576}$
15 16		$-\frac{5}{1728}$	$\frac{5}{96}$	$\frac{5}{64}$	0	$\frac{5}{3456}$	$-\frac{5}{192}$	$-\frac{5}{128}$	$\frac{5}{216}$	0	$-\frac{5}{432}$	0	$\frac{1}{12}$	0	0	$-\frac{1}{24}$	$-\frac{1}{96}$
15 19		$\frac{5}{3456}$	$-\frac{5}{192}$	$-\frac{5}{128}$	0	$-\frac{5}{6912}$	$\frac{5}{384}$	$\frac{5}{256}$	$\frac{5}{108}$	0	$-\frac{5}{216}$	0	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	$\frac{1}{192}$
17 18		0	0	0	0	0	0	0	$-\frac{1}{12}$	0	$\frac{1}{24}$	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	0	0
18 16		$\frac{2}{27}$	0	0	0	$-\frac{1}{27}$	0	0	$\frac{1}{108}$	0	$-\frac{1}{216}$	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	0	0
18 19		$-\frac{1}{27}$	0	0	0	$\frac{1}{54}$	0	0	$\frac{1}{54}$	0	$-\frac{1}{108}$	$\frac{1}{3}$	0	0	$-\frac{1}{6}$	0	0
21 16		0	0	$-\frac{1}{3}$	0	0	0	$\frac{1}{6}$	0	0	0	0	0	0	0	0	0
B M		22214	23224	23424	24324	24424	23222	23314	24224	24414	24222						
1 8		0	0	0	0	0	0	0	0	0	0						
2 6		0	0	0	0	0	0	0	0	0	0						
3 6		0	0	0	0	0	0	0	0	0	0						
3 9		0	0	0	0	0	0	0	0	0	0						
5 3		0	0	0	0	0	0	0	0	0	0						
5 8		0	0	0	0	0	0	0	0	0	0						
6 1		$-\frac{5}{18}$	0	0	0	0	0	0	0	0	0						
6 5		$\frac{5}{36}$	0	0	0	0	0	0	0	0	0						
6 6		$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0						
6 9		$\frac{1}{12}$	0	0	0	0	0	0	0	0	0						
9 18		0	$-\frac{1}{8}$	$\frac{1}{8}$	$-\frac{1}{8}$	$\frac{1}{4}$	0	0	0	0	0						
10 16		0	$-\frac{3}{16}$	$-\frac{1}{48}$	$\frac{3}{16}$	$-\frac{1}{24}$	0	0	0	0	0						
11 16		0	$-\frac{1}{72}$	$-\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{1}{4}$	$\frac{1}{9}$	0	0	0	0						
11 19		0	$\frac{1}{144}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{2}{9}$	0	0	0	0						
13 13		$\frac{5}{64}$	$-\frac{3}{64}$	$-\frac{3}{64}$	$\frac{3}{64}$	$\frac{3}{128}$	0	$-\frac{5}{32}$	$-\frac{9}{128}$	$\frac{15}{64}$	0						
13 18		$\frac{3}{64}$	$\frac{5}{64}$	$\frac{5}{64}$	$-\frac{5}{64}$	$-\frac{5}{128}$	0	$-\frac{3}{32}$	$\frac{15}{128}$	$\frac{9}{64}$	0						
14 11		$\frac{15}{128}$	$-\frac{9}{128}$	$\frac{1}{128}$	$-\frac{9}{128}$	$-\frac{1}{256}$	0	$\frac{15}{64}$	$-\frac{27}{256}$	$-\frac{5}{128}$	0						
14 16		$\frac{9}{128}$	$\frac{15}{128}$	$-\frac{5}{384}$	$\frac{15}{128}$	$\frac{5}{768}$	0	$\frac{9}{64}$	$\frac{45}{256}$	$-\frac{3}{128}$	0						
15 11		$\frac{5}{576}$	$-\frac{1}{192}$	$\frac{3}{64}$	$\frac{3}{64}$	$-\frac{3}{256}$	$\frac{1}{24}$	$-\frac{5}{32}$	$-\frac{1}{128}$	$-\frac{15}{64}$	$\frac{1}{16}$						
15 15		$-\frac{5}{1152}$	$\frac{1}{384}$	$-\frac{3}{128}$	$-\frac{3}{128}$	$\frac{5}{256}$	$\frac{1}{12}$	$\frac{5}{64}$	$\frac{5}{256}$	$\frac{15}{128}$	$\frac{1}{8}$						
15 16		$\frac{1}{192}$	$\frac{5}{576}$	$-\frac{5}{64}$	$-\frac{5}{64}$	$\frac{5}{128}$	$-\frac{5}{72}$	$-\frac{3}{32}$	$\frac{5}{384}$	$-\frac{9}{64}$	$-\frac{5}{48}$						
15 19		$-\frac{1}{384}$	$-\frac{5}{1152}$	$\frac{5}{128}$	$\frac{5}{128}$	$-\frac{5}{256}$	$-\frac{5}{36}$	$\frac{3}{64}$	$-\frac{5}{768}$	$\frac{9}{128}$	$-\frac{5}{24}$						
17 18		0	0	0	0	0	$\frac{1}{4}$	0	0	0	$-\frac{3}{8}$						
18 16		0	$-\frac{2}{9}$	0	0	0	$-\frac{1}{36}$	0	$\frac{1}{3}$	0	$\frac{1}{24}$						
18 19		0	$\frac{1}{9}$	0	0	0	$-\frac{1}{18}$	0	$-\frac{1}{6}$	0	$\frac{1}{12}$						
21 16		0	0	$-\frac{1}{3}$	0	$\frac{1}{6}$	0	0	0	0	0						

$Y = 0 \quad I = 1 \quad J = \frac{3}{2} \quad Y_4 = -\frac{2}{3}$																
B M	12223	12323	21223	22223	23223	12123	12213	21113	22123	22213	23223	24323	23313	24223		
3 10	$\frac{1}{18}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{1}{3}$	0	0	0	0	0	0	0	0	0		
4 7	$\frac{1}{18}$	$-\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{9}$	$-\frac{1}{3}$	0	0	0	0	0	0	0	0	0		
6 4	$-\frac{1}{24}$	0	$\frac{1}{16}$	$-\frac{1}{12}$	0	$-\frac{1}{16}$	$-\frac{5}{48}$	$\frac{5}{16}$	$-\frac{1}{8}$	$-\frac{5}{24}$	0	0	0	0		
6 10	$\frac{5}{72}$	0	$-\frac{5}{48}$	$\frac{5}{36}$	0	$\frac{5}{48}$	$-\frac{1}{16}$	$\frac{3}{16}$	$\frac{5}{24}$	$-\frac{1}{8}$	0	0	0	0		
7 2	$\frac{1}{24}$	0	$-\frac{1}{16}$	$\frac{1}{12}$	0	$-\frac{1}{16}$	$\frac{5}{48}$	$\frac{5}{16}$	$-\frac{1}{8}$	$\frac{5}{24}$	0	0	0	0		
7 7	$-\frac{5}{72}$	0	$\frac{5}{48}$	$-\frac{5}{36}$	0	$\frac{5}{48}$	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{5}{24}$	$\frac{1}{8}$	0	0	0	0		
11 20	$-\frac{2}{9}$	$\frac{1}{6}$	0	$\frac{1}{9}$	$-\frac{1}{12}$	0	0	0	0	0	$-\frac{1}{6}$	$\frac{1}{4}$	0	0		
12 17	$-\frac{2}{9}$	$-\frac{1}{6}$	0	$\frac{1}{9}$	$\frac{1}{12}$	0	0	0	0	0	$-\frac{1}{6}$	$-\frac{1}{4}$	0	0		
15 14	$\frac{1}{48}$	$\frac{1}{16}$	0	$-\frac{1}{96}$	$-\frac{1}{32}$	0	$-\frac{5}{24}$	0	0	$\frac{5}{48}$	$-\frac{1}{16}$	$-\frac{3}{32}$	$\frac{5}{16}$	$-\frac{3}{32}$		
15 20	$-\frac{5}{144}$	$-\frac{5}{48}$	0	$\frac{5}{288}$	$\frac{5}{96}$	0	$-\frac{1}{8}$	0	0	$\frac{1}{16}$	$\frac{5}{48}$	$\frac{5}{32}$	$\frac{3}{16}$	$\frac{5}{32}$		
16 12	$\frac{1}{48}$	$-\frac{1}{16}$	0	$-\frac{1}{96}$	$\frac{1}{32}$	0	$-\frac{5}{24}$	0	0	$\frac{5}{48}$	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{5}{16}$	$-\frac{3}{32}$		
16 17	$-\frac{5}{144}$	$\frac{5}{48}$	0	$\frac{5}{288}$	$-\frac{5}{96}$	0	$-\frac{1}{8}$	0	0	$\frac{1}{16}$	$\frac{5}{48}$	$-\frac{5}{32}$	$-\frac{3}{16}$	$\frac{5}{32}$		
18 20	$\frac{1}{18}$	0	0	$-\frac{1}{36}$	0	$-\frac{1}{3}$	0	0	$\frac{1}{6}$	0	$-\frac{1}{6}$	0	0	$\frac{1}{4}$		
19 17	$-\frac{1}{18}$	0	0	$\frac{1}{36}$	0	$-\frac{1}{3}$	0	0	$\frac{1}{6}$	0	$\frac{1}{6}$	0	0	$-\frac{1}{4}$		
$Y = 0 \quad I = 1 \quad J = \frac{1}{2} \quad Y_4 = \frac{1}{3}$																
B M	12224	12234	12324	12424	12434	21224	21334	22224	22234	22324	22424	22434	12222	12232	21222	22222
1 3	$\frac{1}{32}$	$-\frac{1}{32}$	$-\frac{1}{16}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$-\frac{1}{16}$	$-\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{1}{16}$	0	0	0	0
1 8	$\frac{1}{96}$	$\frac{1}{32}$	$-\frac{1}{48}$	$-\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{16}$	$-\frac{3}{16}$	$\frac{1}{48}$	$\frac{1}{16}$	$-\frac{1}{24}$	$-\frac{1}{16}$	$\frac{3}{16}$	0	0	0	0
2 1	$\frac{3}{64}$	$-\frac{3}{64}$	$\frac{3}{32}$	$\frac{1}{64}$	$\frac{1}{192}$	$\frac{3}{32}$	$-\frac{3}{32}$	$\frac{3}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$	$\frac{3}{32}$	$\frac{1}{96}$	0	0	0	0
2 6	$\frac{1}{64}$	$\frac{9}{64}$	$\frac{1}{32}$	$\frac{1}{192}$	$-\frac{1}{64}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{9}{32}$	$\frac{1}{16}$	$\frac{1}{96}$	$-\frac{1}{32}$	0	0	0	0
3 1	$\frac{1}{288}$	$-\frac{1}{288}$	$-\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{32}$	$\frac{1}{48}$	$\frac{1}{16}$	$\frac{1}{144}$	$-\frac{1}{144}$	$-\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	$-\frac{1}{36}$	$\frac{1}{36}$	$-\frac{1}{6}$	$-\frac{1}{18}$
3 5	$-\frac{1}{576}$	$\frac{1}{576}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{1}{64}$	$-\frac{1}{96}$	$-\frac{3}{32}$	$-\frac{288}{32}$	$\frac{288}{32}$	$\frac{1}{16}$	$-\frac{3}{32}$	$-\frac{1}{32}$	$-\frac{1}{18}$	$\frac{1}{18}$	$-\frac{1}{3}$	$-\frac{1}{9}$
3 6	$\frac{1}{864}$	$\frac{1}{96}$	$-\frac{1}{48}$	$\frac{1}{32}$	$-\frac{3}{32}$	$\frac{1}{144}$	$-\frac{3}{16}$	$\frac{432}{32}$	$\frac{1}{48}$	$-\frac{1}{24}$	$\frac{1}{16}$	$-\frac{3}{16}$	$-\frac{1}{108}$	$-\frac{1}{12}$	$-\frac{1}{18}$	$-\frac{5}{54}$
3 9	$-\frac{1}{1728}$	$-\frac{1}{192}$	$\frac{1}{96}$	$-\frac{1}{64}$	$\frac{3}{64}$	$-\frac{1}{288}$	$\frac{3}{32}$	$-\frac{864}{32}$	$-\frac{1}{96}$	$\frac{1}{48}$	$-\frac{1}{32}$	$\frac{3}{32}$	$-\frac{1}{54}$	$-\frac{1}{6}$	$-\frac{1}{9}$	$-\frac{1}{27}$
5 8	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{1}{6}$	0	$\frac{1}{4}$	$-\frac{1}{3}$
6 6	$\frac{4}{27}$	0	0	0	0	$-\frac{2}{9}$	0	$\frac{8}{27}$	0	0	0	0	$\frac{1}{54}$	0	$-\frac{1}{36}$	$\frac{1}{27}$
6 9	$-\frac{2}{27}$	0	0	0	0	$\frac{1}{9}$	0	$-\frac{4}{27}$	0	0	0	0	$\frac{1}{27}$	0	$-\frac{1}{18}$	$\frac{2}{27}$
9 13	$-\frac{1}{8}$	$-\frac{1}{32}$	$-\frac{1}{16}$	0	$\frac{1}{32}$	0	0	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{32}$	0	$-\frac{1}{64}$	0	0	0	0
9 18	$-\frac{1}{24}$	$\frac{3}{32}$	$-\frac{1}{48}$	0	$-\frac{3}{32}$	0	0	$\frac{1}{48}$	$-\frac{3}{64}$	$\frac{1}{96}$	0	$\frac{3}{64}$	0	0	0	0
10 11	$-\frac{3}{16}$	$-\frac{3}{64}$	0	0	$-\frac{1}{192}$	0	0	$\frac{3}{32}$	$\frac{3}{128}$	0	0	$\frac{1}{384}$	0	0	0	0
10 16	$-\frac{1}{16}$	$\frac{9}{64}$	$\frac{1}{32}$	0	$\frac{1}{64}$	0	0	$\frac{1}{32}$	$-\frac{9}{128}$	$-\frac{1}{64}$	0	$-\frac{1}{128}$	0	0	0	0
11 11	$-\frac{1}{72}$	$-\frac{1}{288}$	$-\frac{1}{16}$	0	$-\frac{1}{32}$	0	0	$\frac{1}{144}$	$\frac{576}{32}$	$\frac{1}{32}$	0	$\frac{1}{64}$	$\frac{1}{9}$	$\frac{1}{36}$	0	$-\frac{1}{18}$
11 15	$\frac{1}{144}$	$\frac{1}{576}$	$\frac{1}{32}$	0	$\frac{1}{64}$	0	0	$-\frac{1}{288}$	$-\frac{1}{1152}$	$-\frac{1}{64}$	0	$-\frac{1}{128}$	$\frac{2}{9}$	$\frac{1}{18}$	0	$-\frac{1}{9}$
11 16	$-\frac{1}{216}$	$\frac{1}{96}$	$-\frac{1}{48}$	0	$\frac{3}{32}$	0	0	$\frac{1}{432}$	$-\frac{1}{192}$	$\frac{1}{96}$	0	$-\frac{3}{64}$	$\frac{1}{27}$	$-\frac{1}{12}$	0	$-\frac{5}{54}$
11 19	$\frac{1}{432}$	$-\frac{1}{192}$	$\frac{1}{96}$	0	$-\frac{3}{64}$	0	0	$-\frac{1}{864}$	$\frac{1}{384}$	$-\frac{1}{192}$	0	$\frac{3}{128}$	$\frac{2}{27}$	$-\frac{1}{6}$	0	$-\frac{1}{27}$
13 18	$-\frac{1}{24}$	0	$\frac{1}{12}$	$-\frac{1}{8}$	0	0	0	$\frac{1}{48}$	0	$-\frac{1}{24}$	$\frac{1}{16}$	0	0	0	0	0
14 16	$-\frac{1}{16}$	0	$-\frac{1}{8}$	$\frac{1}{48}$	0	0	0	$\frac{1}{32}$	0	$\frac{1}{16}$	$-\frac{1}{96}$	0	0	0	0	0
15 16	$-\frac{1}{216}$	0	$\frac{1}{12}$	$\frac{1}{8}$	0	0	0	$\frac{1}{432}$	0	$-\frac{1}{24}$	$-\frac{1}{16}$	0	$\frac{1}{27}$	0	0	$-\frac{5}{54}$
15 19	$\frac{1}{432}$	0	$-\frac{1}{24}$	$-\frac{1}{16}$	0	0	0	$-\frac{1}{864}$	0	$\frac{1}{48}$	$\frac{1}{32}$	0	$\frac{2}{27}$	0	0	$-\frac{1}{27}$
17 13	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{1}{16}$	$\frac{1}{16}$	0	$\frac{1}{32}$
17 18	0	0	0	0	0	0	0	0	0	0	0	0	$-\frac{1}{48}$	$-\frac{3}{16}$	0	$\frac{1}{96}$
18 11	$\frac{1}{18}$	$-\frac{1}{18}$	0	0	0	0	0	$-\frac{1}{36}$	$\frac{1}{36}$	0	0	0	$\frac{1}{144}$	$-\frac{1}{144}$	0	$-\frac{1}{288}$
18 15	$-\frac{1}{36}$	$\frac{1}{36}$	0	0	0	0	0	$\frac{1}{72}$	$-\frac{1}{72}$	0	0	0	$\frac{1}{72}$	$-\frac{1}{72}$	0	$-\frac{1}{144}$
18 16	$\frac{1}{54}$	$\frac{1}{6}$	0	0	0	0	0	$-\frac{1}{108}$	$-\frac{1}{12}$	0	0	0	$\frac{1}{432}$	$\frac{1}{48}$	0	$-\frac{1}{864}$
18 19	$-\frac{1}{108}$	$-\frac{1}{12}$	0	0	0	0	0	$\frac{1}{216}$	$\frac{1}{24}$	0	0	0	$\frac{1}{216}$	$\frac{1}{24}$	0	$-\frac{1}{432}$
21 11	0	0	0	$-\frac{1}{4}$	$\frac{1}{12}$	0	0	0	0	0	0	$\frac{1}{8}$	$-\frac{1}{24}$	0	0	0
21 16	0	0	0	$-\frac{1}{12}$	$-\frac{1}{4}$	0	0	0	0	0	0	$\frac{1}{24}$	$\frac{1}{8}$	0	0	0

B M	22232	12122	22122	23224	23334	23424	24234	24324	24424	24434	23222	24232	24224	24222	23132
1 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 1	$\frac{1}{18}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 5	$\frac{1}{9}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 6	$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 9	$-\frac{1}{3}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 8	0	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0	0
6 6	0	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0	0
6 9	0	$-\frac{1}{6}$	$-\frac{1}{3}$	0	0	0	0	0	0	0	0	0	0	0	0
9 13	0	0	0	$-\frac{3}{32}$	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{3}{32}$	$\frac{3}{16}$	$\frac{3}{64}$	0	0	0	0	0
9 18	0	0	0	$-\frac{1}{32}$	$\frac{3}{16}$	$\frac{1}{32}$	$\frac{9}{64}$	$-\frac{1}{32}$	$\frac{1}{16}$	$-\frac{9}{64}$	0	0	0	0	0
10 11	0	0	0	$-\frac{9}{64}$	0	$-\frac{1}{64}$	$-\frac{9}{128}$	0	$-\frac{1}{32}$	$-\frac{1}{128}$	0	0	0	0	0
10 16	0	0	0	$-\frac{3}{64}$	$-\frac{3}{32}$	$-\frac{1}{192}$	$\frac{27}{128}$	$\frac{3}{64}$	$-\frac{9}{96}$	$\frac{3}{128}$	0	0	0	0	0
11 11	$-\frac{1}{72}$	0	0	$-\frac{1}{96}$	$-\frac{1}{16}$	$-\frac{3}{32}$	$-\frac{1}{192}$	$-\frac{3}{32}$	$-\frac{3}{16}$	$-\frac{3}{64}$	$\frac{1}{12}$	$\frac{1}{24}$	0	0	0
11 15	$-\frac{1}{36}$	0	0	$\frac{1}{192}$	$\frac{3}{32}$	$\frac{1}{64}$	$\frac{3}{384}$	$\frac{1}{64}$	$\frac{3}{32}$	$\frac{3}{128}$	$\frac{1}{6}$	$\frac{1}{12}$	0	0	0
11 16	$\frac{1}{24}$	0	0	$-\frac{1}{288}$	$\frac{3}{16}$	$-\frac{1}{32}$	$\frac{1}{64}$	$-\frac{1}{32}$	$-\frac{1}{16}$	$\frac{9}{64}$	$\frac{1}{36}$	$-\frac{1}{8}$	0	0	0
11 19	$\frac{1}{12}$	0	0	$\frac{1}{576}$	$-\frac{3}{32}$	$\frac{1}{64}$	$-\frac{1}{128}$	$\frac{1}{64}$	$\frac{1}{32}$	$-\frac{9}{128}$	$\frac{1}{18}$	$-\frac{1}{4}$	0	0	0
13 18	0	0	0	$\frac{1}{8}$	0	$\frac{1}{8}$	0	$-\frac{1}{8}$	$-\frac{1}{16}$	0	0	0	$\frac{3}{16}$	0	0
14 16	0	0	0	$\frac{3}{16}$	0	$-\frac{1}{48}$	0	$\frac{3}{16}$	$\frac{1}{96}$	0	0	0	$\frac{9}{32}$	0	0
15 16	0	0	0	$\frac{1}{72}$	0	$-\frac{1}{8}$	0	$-\frac{1}{8}$	$\frac{1}{16}$	0	$-\frac{1}{9}$	0	$\frac{1}{48}$	$-\frac{1}{6}$	0
15 19	0	0	0	$-\frac{1}{144}$	0	$\frac{1}{16}$	0	$\frac{1}{16}$	$-\frac{1}{32}$	0	$-\frac{2}{9}$	0	$-\frac{1}{96}$	$-\frac{1}{3}$	0
17 13	$-\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	0	0	0	0	0	0	0	$\frac{3}{16}$	$-\frac{3}{32}$	0	$-\frac{9}{32}$	$\frac{1}{16}$
17 18	$\frac{3}{32}$	$\frac{1}{24}$	$-\frac{1}{48}$	0	0	0	0	0	0	0	$\frac{1}{16}$	$\frac{9}{32}$	0	$-\frac{3}{32}$	$-\frac{3}{16}$
18 11	$\frac{1}{288}$	$\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{1}{6}$	0	0	$\frac{1}{12}$	0	0	0	$-\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{4}$	$\frac{3}{32}$	$\frac{1}{16}$
18 15	$\frac{1}{144}$	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{12}$	0	0	$-\frac{1}{24}$	0	0	0	$-\frac{1}{24}$	$\frac{1}{48}$	$-\frac{1}{8}$	$\frac{1}{16}$	$\frac{1}{8}$
18 16	$-\frac{1}{96}$	$\frac{1}{24}$	$-\frac{1}{48}$	$-\frac{1}{18}$	0	0	$-\frac{1}{4}$	0	0	0	$-\frac{1}{144}$	$-\frac{1}{32}$	$\frac{1}{12}$	$\frac{1}{96}$	$-\frac{3}{16}$
18 19	$-\frac{1}{48}$	$\frac{1}{12}$	$-\frac{1}{24}$	$\frac{1}{36}$	0	0	$\frac{1}{8}$	0	0	0	$-\frac{1}{72}$	$-\frac{1}{16}$	$-\frac{1}{24}$	$\frac{1}{48}$	$-\frac{3}{8}$
21 11	0	0	0	0	0	$-\frac{1}{4}$	0	0	$\frac{1}{8}$	$-\frac{1}{8}$	0	0	0	0	0
21 16	0	0	0	0	0	$-\frac{1}{12}$	0	0	$\frac{1}{24}$	$\frac{3}{8}$	0	0	0	0	0

$Y = 0 \quad I = 1 \quad J = \frac{1}{2} \quad Y_4 = -\frac{2}{3}$

B M	12223	12233	12323	21223	21333	22223	22233	22323	12123	22123	23223	23333	24233	24323	24223	23133
3 5	$\frac{1}{24}$	$-\frac{1}{24}$	$\frac{1}{8}$	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{4}$	0	0	0	0	0	0	0	0
3 10	$\frac{1}{72}$	$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{12}$	$\frac{3}{8}$	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{12}$	0	0	0	0	0	0	0	0
4 2	$\frac{1}{24}$	$-\frac{1}{24}$	$-\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{12}$	$-\frac{1}{12}$	$-\frac{1}{4}$	0	0	0	0	0	0	0	0
4 7	$\frac{1}{72}$	$\frac{1}{8}$	$-\frac{1}{24}$	$\frac{1}{12}$	$-\frac{3}{8}$	$\frac{1}{36}$	$\frac{1}{4}$	$-\frac{1}{12}$	0	0	0	0	0	0	0	0
6 10	$\frac{1}{9}$	0	0	$-\frac{1}{6}$	0	$\frac{2}{9}$	0	0	$\frac{1}{6}$	$\frac{1}{3}$	0	0	0	0	0	0
7 7	$-\frac{1}{9}$	0	0	$\frac{1}{6}$	0	$-\frac{2}{9}$	0	0	$\frac{1}{6}$	$\frac{1}{3}$	0	0	0	0	0	0
11 14	$-\frac{1}{6}$	$-\frac{1}{24}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$\frac{1}{48}$	$-\frac{1}{16}$	0	0	$-\frac{1}{8}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{3}{16}$	0	0
11 20	$-\frac{1}{18}$	$\frac{1}{8}$	$\frac{1}{24}$	0	0	$\frac{1}{36}$	$-\frac{1}{16}$	$-\frac{1}{48}$	0	0	$-\frac{1}{24}$	$-\frac{3}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	0	0
12 12	$-\frac{1}{6}$	$-\frac{1}{24}$	$-\frac{1}{8}$	0	0	$\frac{1}{12}$	$\frac{1}{48}$	$\frac{1}{16}$	0	0	$-\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{3}{16}$	0	0
12 17	$-\frac{1}{18}$	$\frac{1}{8}$	$-\frac{1}{24}$	0	0	$\frac{1}{36}$	$-\frac{1}{16}$	$\frac{1}{48}$	0	0	$-\frac{1}{24}$	$\frac{3}{8}$	$\frac{3}{16}$	$-\frac{1}{16}$	0	0
15 20	$-\frac{1}{18}$	0	$-\frac{1}{6}$	0	0	$\frac{1}{36}$	0	$\frac{1}{12}$	0	0	$\frac{1}{6}$	0	0	$\frac{1}{4}$	$\frac{1}{4}$	0
16 17	$-\frac{1}{18}$	0	$\frac{1}{6}$	0	0	$\frac{1}{36}$	0	$-\frac{1}{12}$	0	0	$\frac{1}{6}$	0	0	$-\frac{1}{4}$	$\frac{1}{4}$	0
18 14	$\frac{1}{24}$	$-\frac{1}{24}$	0	0	0	$-\frac{1}{48}$	$\frac{1}{48}$	0	$-\frac{1}{4}$	$\frac{1}{8}$	$-\frac{1}{8}$	0	$\frac{1}{16}$	0	$\frac{3}{16}$	$-\frac{1}{8}$
18 20	$\frac{1}{72}$	$\frac{1}{8}$	0	0	0	$-\frac{1}{144}$	$-\frac{1}{16}$	0	$-\frac{1}{12}$	$\frac{1}{24}$	$-\frac{1}{24}$	0	$-\frac{3}{16}$	0	$\frac{1}{16}$	$\frac{3}{8}$
19 12	$-\frac{1}{24}$	$\frac{1}{24}$	0	0	0	$\frac{1}{48}$	$-\frac{1}{48}$	0	$-\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	0	$-\frac{1}{16}$	0	$-\frac{3}{16}$	$-\frac{1}{8}$
19 17	$-\frac{1}{72}$	$-\frac{1}{8}$	0	0	0	$\frac{1}{144}$	$\frac{1}{16}$	0	$-\frac{1}{12}$	$\frac{1}{24}$	$\frac{1}{24}$	0	$\frac{3}{16}$	0	$-\frac{1}{16}$	$\frac{3}{8}$

$Y = 0 \quad I = 0 \quad J = \frac{5}{2} \quad Y_4 = \frac{1}{3}$

B M	12214	22214	23314	24414
6 6	$\frac{1}{3}$	$\frac{2}{3}$	0	0
13 18	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{4}$	$-\frac{3}{8}$
14 19	$\frac{3}{8}$	$-\frac{3}{16}$	$-\frac{3}{8}$	$\frac{1}{16}$
15 16	$\frac{1}{24}$	$-\frac{1}{48}$	$\frac{3}{8}$	$\frac{9}{16}$

$Y = 0 \quad I = 0 \quad J = \frac{5}{2} \quad Y_4 = -\frac{2}{3}$			
B M	12215	22215	24415
7 7	$-\frac{1}{3}$	$-\frac{2}{3}$	0
14 20	$-\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$
16 17	$-\frac{1}{6}$	$\frac{1}{12}$	$-\frac{3}{4}$

$Y = 0 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = \frac{1}{3}$																
B M	12224	12324	12424	21224	22224	22324	22424	12214	22214	23224	23424	24324	24424	23314	24224	24414
1 8	$-\frac{1}{24}$	$\frac{1}{12}$	$\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{1}{12}$	$\frac{1}{6}$	$\frac{1}{4}$	0	0	0	0	0	0	0	0	0
2 9	$-\frac{1}{16}$	$-\frac{1}{8}$	$-\frac{1}{48}$	$-\frac{3}{8}$	$-\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{1}{24}$	0	0	0	0	0	0	0	0	0
3 6	$-\frac{1}{144}$	$\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{1}{24}$	$-\frac{1}{72}$	$\frac{1}{4}$	$-\frac{3}{8}$	0	0	0	0	0	0	0	0	0
6 1	$\frac{1}{12}$	0	0	$-\frac{1}{8}$	$\frac{1}{6}$	0	0	$\frac{5}{24}$	$\frac{5}{12}$	0	0	0	0	0	0	0
6 6	$-\frac{5}{36}$	0	0	$\frac{5}{24}$	$-\frac{5}{18}$	0	0	$\frac{1}{8}$	$\frac{1}{4}$	0	0	0	0	0	0	0
9 18	$\frac{1}{6}$	$\frac{1}{12}$	0	0	$-\frac{1}{12}$	$-\frac{1}{24}$	0	0	0	$\frac{1}{8}$	$-\frac{1}{8}$	$\frac{1}{8}$	$-\frac{1}{4}$	0	0	0
10 19	$\frac{1}{4}$	$-\frac{1}{8}$	0	0	$-\frac{1}{8}$	$\frac{1}{16}$	0	0	0	$\frac{3}{16}$	$\frac{1}{48}$	$-\frac{3}{16}$	$\frac{1}{24}$	0	0	0
11 16	$\frac{1}{36}$	$\frac{1}{8}$	0	0	$-\frac{1}{72}$	$-\frac{1}{16}$	0	0	0	$\frac{1}{48}$	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{3}{8}$	0	0	0
13 13	$-\frac{1}{64}$	$\frac{3}{32}$	$-\frac{3}{64}$	0	$\frac{1}{128}$	$-\frac{1}{64}$	$\frac{3}{128}$	$\frac{5}{32}$	$-\frac{5}{64}$	$\frac{3}{64}$	$\frac{3}{64}$	$-\frac{3}{64}$	$-\frac{3}{128}$	$\frac{5}{32}$	$\frac{9}{128}$	$-\frac{15}{64}$
13 18	$\frac{5}{192}$	$-\frac{5}{96}$	$\frac{5}{64}$	0	$-\frac{5}{384}$	$\frac{1}{192}$	$-\frac{5}{128}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{5}{64}$	$-\frac{5}{64}$	$\frac{5}{64}$	$\frac{5}{128}$	$\frac{3}{32}$	$-\frac{15}{128}$	$-\frac{9}{64}$
14 15	$-\frac{3}{128}$	$-\frac{3}{64}$	$\frac{1}{128}$	0	$\frac{256}{128}$	$\frac{3}{128}$	$-\frac{1}{256}$	$\frac{15}{64}$	$-\frac{15}{128}$	$\frac{9}{128}$	$-\frac{1}{128}$	$\frac{1}{128}$	$\frac{1}{256}$	$-\frac{15}{64}$	$\frac{27}{256}$	$\frac{5}{128}$
14 19	$\frac{5}{128}$	$\frac{3}{64}$	$-\frac{5}{384}$	0	$-\frac{5}{256}$	$-\frac{1}{128}$	$\frac{768}{64}$	$\frac{9}{64}$	$-\frac{9}{128}$	$-\frac{15}{128}$	$\frac{5}{384}$	$-\frac{15}{128}$	$-\frac{9}{768}$	$-\frac{9}{64}$	$-\frac{45}{256}$	$\frac{3}{128}$
15 11	$-\frac{1}{384}$	$\frac{3}{64}$	$\frac{1}{128}$	0	$\frac{1}{768}$	$-\frac{1}{128}$	$-\frac{256}{64}$	$\frac{5}{192}$	$-\frac{5}{384}$	$\frac{1}{128}$	$-\frac{9}{128}$	$\frac{9}{128}$	$\frac{15}{256}$	$\frac{15}{64}$	$\frac{256}{256}$	$\frac{45}{128}$
15 16	$\frac{5}{1152}$	$-\frac{5}{64}$	$-\frac{15}{128}$	0	$-\frac{2304}{128}$	$\frac{5}{128}$	$\frac{256}{64}$	$\frac{1}{64}$	$-\frac{1}{128}$	$-\frac{5}{384}$	$\frac{15}{128}$	$\frac{15}{128}$	$-\frac{15}{256}$	$\frac{9}{64}$	$-\frac{5}{256}$	$\frac{27}{128}$
18 16	$-\frac{1}{9}$	0	0	0	$\frac{1}{18}$	0	0	0	0	$\frac{1}{3}$	0	0	0	0	$-\frac{1}{2}$	0
21 19	0	0	$\frac{1}{3}$	0	0	0	$-\frac{1}{6}$	0	0	0	$\frac{1}{3}$	0	$-\frac{1}{6}$	0	0	0

$Y = 0 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = -\frac{2}{3}$											
B M	12225	12425	21225	22225	22425	12215	22215	23225	23425	24425	24415
2 10	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	0	0	0	0	0	0
4 7	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{18}$	$\frac{1}{2}$	0	0	0	0	0	0
7 2	$-\frac{1}{12}$	0	$\frac{1}{8}$	$-\frac{1}{6}$	0	$-\frac{5}{24}$	$-\frac{5}{12}$	0	0	0	0
7 7	$\frac{5}{36}$	0	$-\frac{5}{24}$	$\frac{5}{18}$	0	$-\frac{1}{8}$	$-\frac{1}{4}$	0	0	0	0
10 20	$-\frac{1}{3}$	0	0	$\frac{1}{6}$	0	0	0	$-\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{6}$	0
12 17	$-\frac{1}{9}$	0	0	$\frac{1}{18}$	0	0	0	$-\frac{1}{12}$	$-\frac{1}{4}$	$-\frac{1}{2}$	0
14 14	$\frac{1}{32}$	$\frac{1}{32}$	0	$-\frac{1}{64}$	$-\frac{1}{64}$	$-\frac{5}{16}$	$\frac{5}{32}$	$-\frac{3}{32}$	$-\frac{1}{32}$	$\frac{1}{64}$	$-\frac{9}{64}$
14 20	$-\frac{5}{96}$	$-\frac{5}{96}$	0	$\frac{5}{192}$	$\frac{5}{192}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{5}{32}$	$-\frac{5}{96}$	$-\frac{5}{192}$	$\frac{15}{64}$
16 12	$\frac{1}{96}$	$-\frac{3}{32}$	0	$-\frac{1}{192}$	$\frac{3}{64}$	$-\frac{5}{48}$	$\frac{5}{96}$	$-\frac{1}{32}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{15}{32}$
16 17	$-\frac{5}{288}$	$\frac{5}{32}$	0	$\frac{5}{576}$	$-\frac{5}{64}$	$-\frac{1}{16}$	$\frac{1}{32}$	$-\frac{5}{96}$	$-\frac{5}{32}$	$\frac{5}{64}$	$-\frac{9}{32}$
19 17	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	0	$\frac{1}{2}$
21 20	0	$-\frac{1}{3}$	0	0	$\frac{1}{6}$	0	0	0	$-\frac{1}{3}$	$\frac{1}{6}$	0

$Y = 0 \quad I = 0 \quad J = \frac{1}{2} \quad Y_4 = \frac{1}{3}$																
B M	12224	12234	12324	12424	12434	21224	21334	22224	22234	22324	22424	22434	23224	23334	23424	24234
1 3	$-\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{16}$	$\frac{3}{32}$	$\frac{1}{32}$	$-\frac{3}{16}$	$-\frac{1}{16}$	$-\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	0	0	0	0
1 8	$-\frac{1}{96}$	$-\frac{3}{32}$	$\frac{1}{48}$	$\frac{1}{32}$	$-\frac{3}{32}$	$-\frac{1}{16}$	$\frac{3}{16}$	$-\frac{1}{48}$	$-\frac{3}{16}$	$\frac{1}{24}$	$\frac{1}{16}$	$-\frac{3}{16}$	0	0	0	0
2 5	$-\frac{3}{64}$	$\frac{3}{64}$	$-\frac{3}{32}$	$-\frac{1}{64}$	$-\frac{1}{192}$	$-\frac{9}{32}$	$\frac{3}{32}$	$-\frac{3}{32}$	$\frac{3}{32}$	$-\frac{3}{16}$	$-\frac{1}{32}$	$-\frac{1}{96}$	0	0	0	0
2 9	$-\frac{1}{64}$	$-\frac{9}{64}$	$-\frac{3}{32}$	$-\frac{1}{192}$	$\frac{1}{64}$	$-\frac{3}{32}$	$-\frac{9}{32}$	$-\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{1}{16}$	$-\frac{1}{96}$	$\frac{1}{32}$	0	0	0	0
3 1	$-\frac{1}{192}$	$\frac{1}{192}$	$\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{3}{64}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{1}{96}$	$\frac{1}{96}$	$\frac{3}{16}$	$-\frac{9}{32}$	$-\frac{3}{32}$	0	0	0	0
3 6	$-\frac{1}{576}$	$-\frac{1}{64}$	$\frac{3}{32}$	$-\frac{3}{64}$	$\frac{9}{64}$	$-\frac{9}{96}$	$\frac{3}{32}$	$-\frac{1}{288}$	$-\frac{1}{32}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{9}{32}$	0	0	0	0
6 6	$-\frac{2}{9}$	0	0	0	0	$\frac{1}{3}$	0	$-\frac{4}{9}$	0	0	0	0	0	0	0	0
9 13	$\frac{1}{8}$	$\frac{1}{32}$	$\frac{1}{16}$	0	$-\frac{1}{32}$	0	0	$-\frac{1}{16}$	$-\frac{1}{64}$	$-\frac{1}{32}$	0	$\frac{1}{64}$	$\frac{3}{32}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{3}{64}$
9 18	$\frac{1}{24}$	$-\frac{3}{32}$	$\frac{1}{48}$	0	$\frac{3}{32}$	0	0	$-\frac{1}{48}$	$\frac{1}{64}$	$-\frac{1}{96}$	0	$-\frac{3}{64}$	$\frac{1}{32}$	$-\frac{3}{16}$	$-\frac{1}{32}$	$-\frac{9}{64}$
10 15	$\frac{3}{16}$	$\frac{3}{64}$	$-\frac{3}{32}$	0	$\frac{1}{192}$	0	0	$-\frac{3}{32}$	$-\frac{3}{128}$	$\frac{3}{64}$	0	$-\frac{1}{384}$	$\frac{9}{64}$	$-\frac{3}{32}$	$\frac{1}{64}$	$\frac{9}{128}$
10 19	$\frac{1}{16}$	$-\frac{9}{64}$	$-\frac{1}{32}$	0	$-\frac{1}{64}$	0	0	$-\frac{1}{32}$	$\frac{9}{128}$	$\frac{1}{64}$	0	$\frac{1}{128}$	$\frac{3}{64}$	$\frac{9}{32}$	$\frac{1}{192}$	$-\frac{27}{128}$
11 11	$\frac{1}{48}$	$\frac{1}{192}$	$\frac{3}{32}$	0	$\frac{3}{64}$	0	0	$-\frac{1}{96}$	$-\frac{1}{384}$	$-\frac{3}{64}$	0	$-\frac{3}{128}$	$\frac{1}{64}$	$\frac{3}{32}$	$\frac{9}{64}$	$\frac{1}{128}$
11 16	$\frac{1}{144}$	$-\frac{1}{64}$	$\frac{1}{32}$	0	$-\frac{9}{64}$	0	0	$-\frac{1}{288}$	$\frac{1}{128}$	$-\frac{1}{64}$	0	$\frac{9}{128}$	$\frac{1}{192}$	$-\frac{9}{32}$	$\frac{3}{64}$	$-\frac{3}{128}$
13 18	$\frac{1}{24}$	0	$-\frac{1}{12}$	$\frac{1}{8}$	0	0	0	$-\frac{1}{48}$	0	$\frac{1}{24}$	$-\frac{1}{16}$	0	$-\frac{1}{8}$	0	$-\frac{1}{8}$	0
14 19	$\frac{1}{16}$	0	$\frac{1}{8}$	$-\frac{1}{48}$	0	0	0	$-\frac{1}{32}$	0	$-\frac{1}{16}$	$\frac{1}{96}$	0	$-\frac{3}{16}$	0	$\frac{1}{48}$	0
15 16	$\frac{1}{144}$	0	$-\frac{1}{8}$	$-\frac{3}{16}$	0	0	0	$-\frac{1}{288}$	0	$\frac{1}{16}$	$\frac{3}{32}$	0	$-\frac{1}{48}$	0	$\frac{3}{16}$	0
18 11	$\frac{1}{192}$	$-\frac{1}{192}$	0	0	0	0	0	$-\frac{1}{384}$	$\frac{1}{384}$	0	0	0	$-\frac{1}{64}$	0	0	$\frac{1}{128}$
18 16	$-\frac{1}{36}$	$-\frac{1}{4}$	0	0	0	0	0	$\frac{1}{72}$	$\frac{1}{8}$	0	0	0	$\frac{1}{12}$	0	0	$\frac{3}{8}$
21 15	0	0	0	$\frac{1}{4}$	$-\frac{1}{12}$	0	0	0	0	0	$-\frac{1}{8}$	$\frac{1}{24}$	0	0	$\frac{1}{4}$	0
21 19	0	0	0	$\frac{1}{12}$	$\frac{1}{4}$	0	0	0	0	0	$-\frac{1}{24}$	$-\frac{1}{8}$	0	0	$\frac{1}{12}$	0

B M	24324	24424	24434	24224
1 3	0	0	0	0
1 8	0	0	0	0
2 5	0	0	0	0
2 9	0	0	0	0
3 1	0	0	0	0
3 6	0	0	0	0
6 6	0	0	0	0
9 13	$\frac{3}{32}$	$-\frac{3}{16}$	$-\frac{3}{64}$	0
9 18	$\frac{1}{32}$	$-\frac{1}{16}$	$\frac{9}{64}$	0
10 15	$-\frac{9}{64}$	$\frac{1}{32}$	$\frac{1}{128}$	0
10 19	$-\frac{3}{64}$	$\frac{1}{96}$	$-\frac{3}{128}$	0
11 11	$\frac{9}{64}$	$\frac{9}{32}$	$\frac{9}{128}$	0
11 16	$\frac{3}{64}$	$\frac{3}{32}$	$-\frac{27}{128}$	0
13 18	$\frac{1}{8}$	$\frac{1}{16}$	0	$-\frac{3}{16}$
14 19	$-\frac{3}{16}$	$-\frac{1}{96}$	0	$-\frac{9}{32}$
15 16	$\frac{3}{16}$	$-\frac{3}{32}$	0	$-\frac{1}{32}$
18 11	0	0	0	$\frac{3}{128}$
18 16	0	0	0	$-\frac{1}{8}$
21 15	0	$-\frac{1}{8}$	$\frac{1}{8}$	0
21 19	0	$-\frac{1}{24}$	$-\frac{3}{8}$	0

$Y = 0 \quad I = 0 \quad J = \frac{1}{2} \quad Y_4 = -\frac{2}{3}$

B M	12225	12235	12425	12435	21225	22225	22235	22425	22435	23225	23425	24235	24425	24435	24225
2 4	$\frac{1}{16}$	$-\frac{1}{16}$	$-\frac{1}{16}$	$-\frac{1}{48}$	$\frac{3}{8}$	$\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{1}{24}$	0	0	0	0	0	0
2 10	$\frac{1}{48}$	$\frac{3}{16}$	$-\frac{1}{48}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{24}$	$\frac{3}{8}$	$-\frac{1}{24}$	$\frac{1}{8}$	0	0	0	0	0	0
4 2	$\frac{1}{48}$	$-\frac{1}{48}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{24}$	$-\frac{1}{24}$	$\frac{3}{8}$	$\frac{1}{8}$	0	0	0	0	0	0
4 7	$\frac{1}{144}$	$\frac{1}{16}$	$\frac{1}{16}$	$-\frac{3}{16}$	$\frac{1}{24}$	$\frac{1}{72}$	$\frac{1}{8}$	$\frac{1}{8}$	$-\frac{3}{8}$	0	0	0	0	0	0
7 7	$\frac{2}{9}$	0	0	0	$-\frac{1}{3}$	$\frac{4}{9}$	0	0	0	0	0	0	0	0	0
10 14	$-\frac{1}{4}$	$-\frac{1}{16}$	0	$\frac{1}{48}$	0	$\frac{1}{8}$	$\frac{1}{32}$	0	$-\frac{1}{96}$	$-\frac{3}{16}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{1}{8}$	$\frac{1}{32}$	0
10 20	$-\frac{1}{12}$	$\frac{3}{16}$	0	$-\frac{1}{16}$	0	$\frac{1}{24}$	$-\frac{3}{32}$	0	$\frac{1}{32}$	$-\frac{1}{16}$	$\frac{1}{48}$	$\frac{9}{32}$	$\frac{1}{24}$	$-\frac{3}{32}$	0
12 12	$-\frac{1}{12}$	$-\frac{1}{48}$	0	$-\frac{1}{16}$	0	$\frac{1}{24}$	$\frac{1}{96}$	0	$\frac{1}{32}$	$-\frac{1}{16}$	$-\frac{3}{16}$	$-\frac{1}{32}$	$-\frac{3}{8}$	$-\frac{3}{32}$	0
12 17	$-\frac{1}{36}$	$\frac{1}{16}$	0	$\frac{3}{16}$	0	$\frac{1}{72}$	$-\frac{1}{32}$	0	$-\frac{3}{32}$	$-\frac{1}{48}$	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{1}{8}$	$\frac{9}{32}$	0
14 20	$-\frac{1}{12}$	0	$-\frac{1}{12}$	0	0	$\frac{1}{24}$	0	$\frac{1}{24}$	0	$\frac{1}{4}$	$\frac{1}{12}$	0	$-\frac{1}{24}$	0	$\frac{3}{8}$
16 17	$-\frac{1}{36}$	0	$\frac{1}{4}$	0	0	$\frac{1}{72}$	0	$-\frac{1}{8}$	0	$\frac{1}{12}$	$-\frac{1}{4}$	0	$\frac{1}{8}$	0	$\frac{1}{8}$
19 12	$\frac{1}{12}$	$-\frac{1}{12}$	0	0	0	$-\frac{1}{24}$	$\frac{1}{24}$	0	0	$-\frac{1}{4}$	0	$\frac{1}{8}$	0	0	$\frac{3}{8}$
19 17	$\frac{1}{36}$	$\frac{1}{4}$	0	0	0	$-\frac{1}{72}$	$-\frac{1}{8}$	0	0	$-\frac{1}{12}$	0	$-\frac{3}{8}$	0	0	$\frac{1}{8}$
21 14	0	0	$-\frac{1}{4}$	$\frac{1}{12}$	0	0	0	$\frac{1}{8}$	$-\frac{1}{24}$	0	$-\frac{1}{4}$	0	$\frac{1}{8}$	$-\frac{1}{8}$	0
21 20	0	0	$-\frac{1}{12}$	$-\frac{1}{4}$	0	0	0	$\frac{1}{24}$	$\frac{1}{8}$	0	$-\frac{1}{12}$	0	$\frac{1}{24}$	$\frac{3}{8}$	0

$Y = -1 \quad I = \frac{3}{2} \quad J = \frac{5}{2} \quad Y_4 = -\frac{2}{3}$

B M	12213	21113	22213	23313
6 8	$\frac{1}{6}$	$-\frac{1}{2}$	$\frac{1}{3}$	0
7 6	$-\frac{1}{6}$	$-\frac{1}{2}$	$-\frac{1}{3}$	0
15 18	$\frac{1}{3}$	0	$-\frac{1}{6}$	$-\frac{1}{2}$
16 16	$\frac{1}{3}$	0	$-\frac{1}{6}$	$\frac{1}{2}$

$Y = -1 \quad I = \frac{3}{2} \quad J = \frac{3}{2} \quad Y_4 = -\frac{2}{3}$

B M	12223	12323	21223	22223	22323	12123	12213	21113	22123	22213	23223	24323	23313	24223
3 8	$-\frac{1}{18}$	$-\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{9}$	$-\frac{1}{3}$	0	0	0	0	0	0	0	0	0
4 6	$-\frac{1}{18}$	$\frac{1}{6}$	$-\frac{1}{3}$	$-\frac{1}{9}$	$\frac{1}{3}$	0	0	0	0	0	0	0	0	0
6 3	$\frac{1}{24}$	0	$-\frac{1}{16}$	$\frac{1}{12}$	0	$\frac{1}{16}$	$\frac{5}{48}$	$-\frac{5}{16}$	$\frac{1}{8}$	$\frac{5}{24}$	0	0	0	0
6 8	$-\frac{5}{72}$	0	$\frac{5}{48}$	$-\frac{5}{36}$	0	$-\frac{5}{48}$	$\frac{1}{16}$	$-\frac{3}{16}$	$-\frac{5}{24}$	$\frac{1}{8}$	0	0	0	0
7 1	$-\frac{1}{24}$	0	$\frac{1}{16}$	$-\frac{1}{12}$	0	$\frac{1}{16}$	$-\frac{5}{48}$	$-\frac{5}{16}$	$\frac{1}{8}$	$-\frac{5}{24}$	0	0	0	0
7 6	$\frac{5}{72}$	0	$-\frac{5}{48}$	$\frac{5}{36}$	0	$-\frac{5}{48}$	$-\frac{1}{16}$	$-\frac{3}{16}$	$-\frac{5}{24}$	$-\frac{1}{8}$	0	0	0	0
11 18	$\frac{2}{9}$	$-\frac{1}{6}$	0	$-\frac{1}{9}$	$\frac{1}{12}$	0	0	0	0	0	$\frac{1}{6}$	$-\frac{1}{4}$	0	0
12 16	$\frac{2}{9}$	$\frac{1}{6}$	0	$-\frac{1}{9}$	$-\frac{1}{12}$	0	0	0	0	0	$\frac{1}{6}$	$\frac{1}{4}$	0	0
15 13	$-\frac{1}{48}$	$-\frac{1}{16}$	0	$\frac{1}{96}$	$\frac{1}{32}$	0	$\frac{5}{24}$	0	0	$-\frac{5}{48}$	$\frac{1}{16}$	$\frac{3}{32}$	$-\frac{5}{16}$	$\frac{3}{32}$
15 18	$\frac{5}{144}$	$\frac{5}{48}$	0	$-\frac{5}{288}$	$-\frac{5}{96}$	0	$\frac{1}{8}$	0	0	$-\frac{1}{16}$	$-\frac{5}{48}$	$-\frac{5}{32}$	$-\frac{3}{16}$	$-\frac{5}{32}$
16 11	$-\frac{1}{48}$	$\frac{1}{16}$	0	$\frac{1}{96}$	$-\frac{1}{32}$	0	$\frac{5}{24}$	0	0	$-\frac{5}{48}$	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{5}{16}$	$\frac{3}{32}$
16 16	$\frac{5}{144}$	$-\frac{5}{48}$	0	$-\frac{5}{288}$	$\frac{5}{96}$	0	$\frac{1}{8}$	0	0	$-\frac{1}{16}$	$-\frac{5}{48}$	$\frac{5}{32}$	$\frac{3}{16}$	$-\frac{5}{32}$
18 18	$-\frac{1}{18}$	0	0	$\frac{1}{36}$	0	$\frac{1}{3}$	0	0	$-\frac{1}{6}$	0	$\frac{1}{6}$	0	0	$-\frac{1}{4}$
19 16	$\frac{1}{18}$	0	0	$-\frac{1}{36}$	0	$\frac{1}{3}$	0	0	$-\frac{1}{6}$	0	$-\frac{1}{6}$	0	0	$\frac{1}{4}$

		$Y = -1 \quad I = \frac{3}{2} \quad J = \frac{1}{2} \quad Y_4 = -\frac{2}{3}$															
B M		12223	12233	12323	21223	21333	22223	22233	22323	12123	22123	23223	23333	24233	24323	24223	23133
3 3		$-\frac{1}{24}$	$\frac{1}{24}$	$-\frac{1}{8}$	$-\frac{1}{4}$	$\frac{1}{8}$	$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{4}$	0	0	0	0	0	0	0	0
3 8		$-\frac{1}{72}$	$-\frac{1}{8}$	$-\frac{1}{24}$	$-\frac{1}{12}$	$-\frac{3}{8}$	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{12}$	0	0	0	0	0	0	0	0
4 1		$-\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{8}$	$-\frac{1}{4}$	$-\frac{1}{8}$	$-\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{4}$	0	0	0	0	0	0	0	0
4 6		$-\frac{1}{72}$	$-\frac{1}{8}$	$\frac{1}{24}$	$-\frac{1}{12}$	$\frac{3}{8}$	$-\frac{1}{36}$	$-\frac{1}{4}$	$\frac{1}{12}$	0	0	0	0	0	0	0	0
6 8		$-\frac{1}{9}$	0	0	$\frac{1}{6}$	0	$-\frac{2}{9}$	0	0	$-\frac{1}{6}$	$-\frac{1}{3}$	0	0	0	0	0	0
7 6		$\frac{1}{9}$	0	0	$-\frac{1}{6}$	0	$\frac{2}{9}$	0	0	$-\frac{1}{6}$	$-\frac{1}{3}$	0	0	0	0	0	0
11 13		$\frac{1}{6}$	$\frac{1}{24}$	$-\frac{1}{8}$	0	0	$-\frac{1}{12}$	$-\frac{1}{48}$	$\frac{1}{16}$	0	0	$\frac{1}{8}$	$-\frac{1}{8}$	$\frac{1}{16}$	$-\frac{3}{16}$	0	0
11 18		$\frac{1}{18}$	$-\frac{1}{8}$	$-\frac{1}{24}$	0	0	$-\frac{1}{36}$	$\frac{1}{16}$	$\frac{1}{48}$	0	0	$\frac{1}{24}$	$\frac{3}{8}$	$-\frac{3}{16}$	$-\frac{1}{16}$	0	0
12 11		$\frac{1}{6}$	$\frac{1}{24}$	$\frac{1}{8}$	0	0	$-\frac{1}{12}$	$-\frac{1}{48}$	$-\frac{1}{16}$	0	0	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{16}$	0	0
12 16		$\frac{1}{18}$	$-\frac{1}{8}$	$\frac{1}{24}$	0	0	$-\frac{1}{36}$	$\frac{1}{16}$	$-\frac{1}{48}$	0	0	$\frac{1}{24}$	$-\frac{3}{8}$	$-\frac{3}{16}$	$\frac{1}{16}$	0	0
15 18		$\frac{1}{18}$	0	$\frac{1}{6}$	0	0	$-\frac{1}{36}$	0	$-\frac{1}{12}$	0	0	$-\frac{1}{6}$	0	0	$-\frac{1}{4}$	$-\frac{1}{4}$	0
16 16		$\frac{1}{18}$	0	$-\frac{1}{6}$	0	0	$-\frac{1}{36}$	0	$\frac{1}{12}$	0	0	$-\frac{1}{6}$	0	0	$\frac{1}{4}$	$-\frac{1}{4}$	0
18 13		$-\frac{1}{24}$	$\frac{1}{24}$	0	0	0	$\frac{1}{48}$	$-\frac{1}{48}$	0	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{8}$	0	$-\frac{1}{16}$	0	$-\frac{3}{16}$	$\frac{1}{8}$
18 18		$-\frac{1}{72}$	$-\frac{1}{8}$	0	0	0	$\frac{1}{144}$	$\frac{1}{16}$	0	$\frac{1}{12}$	$-\frac{1}{24}$	$\frac{1}{24}$	0	$\frac{3}{16}$	0	$-\frac{1}{16}$	$-\frac{3}{8}$
19 11		$\frac{1}{24}$	$-\frac{1}{24}$	0	0	0	$-\frac{1}{48}$	$\frac{1}{48}$	0	$\frac{1}{4}$	$-\frac{1}{8}$	$-\frac{1}{8}$	0	$\frac{1}{16}$	0	$\frac{3}{16}$	$\frac{1}{8}$
19 16		$\frac{1}{72}$	$\frac{1}{8}$	0	0	0	$-\frac{1}{144}$	$-\frac{1}{16}$	0	$\frac{1}{12}$	$-\frac{1}{24}$	$-\frac{1}{24}$	0	$-\frac{3}{16}$	0	$\frac{1}{16}$	$-\frac{3}{8}$

		$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{5}{2} \quad Y_4 = -\frac{2}{3}$						
B M		12213	21113	22213	12215	22215	24415	23313

6 8		$-\frac{1}{6}$	$\frac{1}{2}$	$-\frac{1}{3}$	0	0	0	0
7 6		$\frac{1}{24}$	$\frac{1}{8}$	$\frac{1}{12}$	$\frac{1}{4}$	$\frac{1}{2}$	0	0
7 9		$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0
14 18		0	0	0	$\frac{1}{2}$	$-\frac{1}{4}$	$-\frac{1}{4}$	0
15 18		$-\frac{1}{3}$	0	$\frac{1}{6}$	0	0	0	$\frac{1}{2}$
16 16		$-\frac{1}{12}$	0	$\frac{1}{24}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{9}{16}$	$-\frac{1}{8}$
16 19		$-\frac{1}{4}$	0	$\frac{1}{8}$	$-\frac{1}{24}$	$\frac{1}{48}$	$-\frac{3}{16}$	$-\frac{3}{8}$

		$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{5}{2} \quad Y_4 = -\frac{5}{3}$		
B M		12214	21114	22214

7 10		$\frac{1}{12}$	$-\frac{3}{4}$	$\frac{1}{6}$
8 7		$-\frac{1}{4}$	$-\frac{1}{4}$	$-\frac{1}{2}$
16 20		$\frac{2}{3}$	0	$-\frac{1}{3}$

		$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{3}{2} \quad Y_4 = -\frac{2}{3}$															
B M		12225	12425	21225	22225	22425	12223	12323	21223	22223	22323	12123	12213	21113	22123	22213	12215
2 8		$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0
3 8		0	0	0	0	0	$\frac{1}{18}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{9}$	$\frac{1}{3}$	0	0	0	0	0	0
4 6		$-\frac{1}{48}$	$-\frac{3}{16}$	$-\frac{1}{8}$	$-\frac{1}{24}$	$-\frac{3}{8}$	$\frac{1}{72}$	$-\frac{1}{24}$	$\frac{1}{12}$	$\frac{1}{36}$	$-\frac{1}{12}$	0	0	0	0	0	0
4 9		$\frac{1}{144}$	$\frac{1}{16}$	$\frac{1}{24}$	$\frac{1}{72}$	$\frac{1}{8}$	$\frac{1}{24}$	$-\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{12}$	$-\frac{1}{4}$	0	0	0	0	0	0
6 3		0	0	0	0	0	$-\frac{1}{24}$	0	$\frac{1}{16}$	$-\frac{1}{12}$	0	$-\frac{1}{16}$	$-\frac{5}{48}$	$\frac{5}{16}$	$-\frac{1}{8}$	$-\frac{5}{24}$	0
6 8		0	0	0	0	0	$\frac{5}{72}$	0	$-\frac{5}{48}$	$\frac{5}{36}$	0	$\frac{5}{48}$	$-\frac{1}{16}$	$\frac{3}{16}$	$\frac{5}{24}$	$-\frac{1}{8}$	0
7 1		$\frac{1}{16}$	0	$-\frac{3}{32}$	$\frac{1}{8}$	0	$\frac{1}{96}$	0	$-\frac{1}{64}$	$\frac{1}{48}$	0	$-\frac{1}{64}$	$\frac{5}{192}$	$\frac{5}{64}$	$-\frac{1}{32}$	$\frac{5}{96}$	$\frac{5}{32}$
7 5		$-\frac{1}{48}$	0	$\frac{1}{32}$	$-\frac{1}{24}$	0	$\frac{1}{32}$	0	$-\frac{3}{64}$	$\frac{1}{16}$	0	$-\frac{3}{64}$	$\frac{5}{64}$	$\frac{15}{64}$	$-\frac{3}{32}$	$\frac{5}{32}$	$-\frac{5}{96}$
7 6		$-\frac{5}{48}$	0	$\frac{5}{32}$	$-\frac{1}{24}$	0	$-\frac{5}{288}$	0	$\frac{5}{192}$	$-\frac{1}{144}$	0	$\frac{5}{192}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{5}{96}$	$\frac{3}{32}$	$\frac{3}{32}$
7 9		$\frac{1}{144}$	0	$-\frac{5}{96}$	$\frac{1}{72}$	0	$-\frac{5}{96}$	0	$\frac{5}{64}$	$-\frac{1}{48}$	0	$\frac{5}{64}$	$\frac{3}{64}$	$\frac{5}{64}$	$\frac{3}{32}$	$\frac{3}{32}$	$-\frac{1}{32}$
10 18		$\frac{1}{3}$	0	0	$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0	0
11 18		0	0	0	0	0	$-\frac{2}{9}$	$\frac{1}{6}$	0	$\frac{1}{9}$	$-\frac{1}{12}$	0	0	0	0	0	0
12 16		$\frac{1}{12}$	0	0	$-\frac{1}{24}$	0	$-\frac{1}{18}$	$-\frac{1}{24}$	0	$\frac{1}{36}$	$\frac{1}{48}$	0	0	0	0	0	0
12 19		$-\frac{1}{36}$	0	0	$\frac{1}{72}$	0	$-\frac{1}{6}$	$-\frac{1}{8}$	0	$\frac{1}{12}$	$\frac{1}{16}$	0	0	0	0	0	0
14 13		$-\frac{1}{32}$	$-\frac{1}{32}$	0	$\frac{1}{64}$	$\frac{1}{64}$	0	0	0	0	0	0	0	0	0	0	$\frac{5}{16}$
14 18		$\frac{5}{96}$	$\frac{5}{96}$	0	$-\frac{5}{192}$	$-\frac{5}{192}$	0	0	0	0	0	0	0	0	0	0	$\frac{3}{16}$
15 13		0	0	0	0	0	$\frac{1}{48}$	$\frac{1}{16}$	0	$-\frac{1}{96}$	$-\frac{1}{32}$	0	$-\frac{5}{24}$	0	0	$\frac{5}{48}$	0
15 18		0	0	0	0	0	$-\frac{5}{144}$	$-\frac{5}{48}$	0	$\frac{5}{288}$	$\frac{5}{96}$	0	$-\frac{1}{8}$	0	0	$\frac{1}{16}$	0
16 11		$-\frac{1}{128}$	$\frac{9}{128}$	0	$\frac{1}{256}$	$-\frac{9}{256}$	$\frac{1}{192}$	$-\frac{1}{64}$	0	$-\frac{1}{384}$	$\frac{1}{128}$	0	$-\frac{5}{96}$	0	0	$\frac{5}{192}$	$\frac{5}{64}$
16 15		$\frac{1}{384}$	$-\frac{3}{128}$	0	$-\frac{3}{768}$	$\frac{3}{256}$	$\frac{3}{64}$	$-\frac{3}{64}$	0	$-\frac{1}{128}$	$\frac{3}{128}$	0	$-\frac{5}{32}$	0	0	$\frac{5}{64}$	$-\frac{5}{192}$
16 16		$\frac{5}{384}$	$-\frac{15}{128}$	0	$-\frac{5}{768}$	$\frac{15}{256}$	$-\frac{5}{576}$	$\frac{5}{192}$	0	$\frac{5}{1152}$	$-\frac{5}{384}$	0	$-\frac{1}{32}$	0	0	$\frac{1}{64}$	$\frac{3}{64}$
16 19		$-\frac{5}{1152}$	$\frac{5}{128}$	0	$\frac{5}{2304}$	$-\frac{5}{256}$	$-\frac{5}{192}$	$\frac{5}{64}$	0	$\frac{5}{384}$	$-\frac{5}{128}$	0	$-\frac{3}{32}$	0	0	$\frac{3}{64}$	$-\frac{1}{64}$
18 18		0	0	0	0	0	$\frac{1}{18}$	0	0	$-\frac{1}{36}$	0	$-\frac{1}{3}$	0	0	$\frac{1}{6}$	0	0
19 16		$-\frac{1}{12}$	0	0	$\frac{1}{24}$	0	$-\frac{1}{72}$	0	0	$\frac{1}{144}$	0	$-\frac{1}{12}$	0	0	$\frac{1}{24}$	0	0
19 19		$\frac{1}{36}$	0	0	$-\frac{1}{72}$	0	$-\frac{1}{24}$	0	0	$\frac{1}{48}$	0	$-\frac{1}{4}$	0	0	$\frac{1}{8}$	0	0
21 18		0	$\frac{1}{3}$	0	0	$-\frac{1}{6}$	0	0	0	0	0	0	0	0	0	0	0

B M	22215	23225	23425	24425	23223	24323	24225	24415	23313	24223
2 8	0	0	0	0	0	0	0	0	0	0
3 8	0	0	0	0	0	0	0	0	0	0
4 6	0	0	0	0	0	0	0	0	0	0
4 9	0	0	0	0	0	0	0	0	0	0
6 3	0	0	0	0	0	0	0	0	0	0
6 8	0	0	0	0	0	0	0	0	0	0
7 1	$\frac{5}{16}$	0	0	0	0	0	0	0	0	0
7 5	$-\frac{5}{48}$	0	0	0	0	0	0	0	0	0
7 6	$\frac{3}{16}$	0	0	0	0	0	0	0	0	0
7 9	$-\frac{1}{16}$	0	0	0	0	0	0	0	0	0
10 18	0	$\frac{1}{4}$	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0	0	0
11 18	0	0	0	0	$-\frac{1}{6}$	$\frac{1}{4}$	0	0	0	0
12 16	0	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{3}{8}$	$-\frac{1}{24}$	$-\frac{1}{16}$	0	0	0	0
12 19	0	$-\frac{1}{48}$	$-\frac{1}{16}$	$-\frac{1}{8}$	$-\frac{1}{8}$	$-\frac{3}{16}$	0	0	0	0
14 13	$-\frac{5}{32}$	$\frac{3}{32}$	$\frac{1}{32}$	$-\frac{1}{64}$	0	0	$\frac{9}{64}$	$-\frac{5}{32}$	0	0
14 18	$-\frac{3}{32}$	$-\frac{5}{32}$	$-\frac{5}{96}$	$\frac{5}{192}$	0	0	$-\frac{15}{64}$	$-\frac{3}{32}$	0	0
15 13	0	0	0	0	$-\frac{1}{16}$	$-\frac{3}{32}$	0	0	$\frac{5}{16}$	$-\frac{3}{32}$
15 18	0	0	0	0	$\frac{5}{48}$	$\frac{5}{32}$	0	0	$\frac{3}{16}$	$\frac{5}{32}$
16 11	$-\frac{5}{128}$	$\frac{3}{128}$	$-\frac{9}{128}$	$\frac{9}{256}$	$-\frac{1}{64}$	$\frac{3}{128}$	$\frac{9}{256}$	$\frac{45}{128}$	$-\frac{5}{64}$	$-\frac{3}{128}$
16 15	$\frac{5}{384}$	$-\frac{1}{128}$	$\frac{3}{128}$	$-\frac{3}{256}$	$-\frac{3}{64}$	$\frac{9}{128}$	$-\frac{3}{256}$	$-\frac{15}{128}$	$-\frac{15}{64}$	$-\frac{9}{128}$
16 16	$-\frac{3}{128}$	$-\frac{5}{128}$	$\frac{15}{128}$	$-\frac{15}{256}$	$\frac{5}{192}$	$-\frac{5}{128}$	$-\frac{15}{256}$	$\frac{27}{128}$	$-\frac{3}{64}$	$\frac{5}{128}$
16 19	$\frac{1}{128}$	$\frac{5}{384}$	$-\frac{5}{128}$	$\frac{5}{256}$	$\frac{5}{64}$	$-\frac{15}{128}$	$\frac{5}{256}$	$-\frac{9}{128}$	$-\frac{9}{64}$	$\frac{15}{128}$
18 18	0	0	0	0	$-\frac{1}{6}$	0	0	0	0	$\frac{1}{4}$
19 16	0	$\frac{1}{4}$	0	0	$\frac{1}{24}$	0	$-\frac{3}{8}$	0	0	$-\frac{1}{16}$
19 19	0	$-\frac{1}{12}$	0	0	$\frac{1}{8}$	0	$\frac{1}{8}$	0	0	$-\frac{3}{16}$
21 18	0	0	$\frac{1}{3}$	$-\frac{1}{6}$	0	0	0	0	0	0
$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{3}{2} \quad Y_4 = -\frac{5}{3}$										
B M	12224	21224	22224	12124	12214	21114	22124	22214	23224	24224
4 10	$-\frac{1}{9}$	$-\frac{2}{3}$	$-\frac{2}{9}$	0	0	0	0	0	0	0
7 4	$\frac{1}{48}$	$-\frac{1}{32}$	$\frac{1}{24}$	$\frac{3}{32}$	$\frac{5}{96}$	$-\frac{15}{32}$	$\frac{3}{16}$	$\frac{5}{48}$	0	0
7 10	$-\frac{5}{144}$	$\frac{5}{96}$	$-\frac{5}{72}$	$-\frac{5}{32}$	$\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{5}{16}$	$\frac{1}{16}$	0	0
8 2	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{1}{8}$	$\frac{1}{32}$	$-\frac{5}{32}$	$-\frac{5}{32}$	$\frac{1}{16}$	$-\frac{5}{16}$	0	0
8 7	$\frac{5}{48}$	$-\frac{5}{32}$	$\frac{5}{24}$	$-\frac{5}{96}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{5}{48}$	$-\frac{3}{16}$	0	0
12 20	$\frac{4}{9}$	0	$-\frac{2}{9}$	0	0	0	0	0	$\frac{1}{3}$	0
16 14	$-\frac{1}{24}$	0	$\frac{1}{48}$	0	$\frac{5}{12}$	0	0	$-\frac{5}{24}$	$\frac{1}{8}$	$\frac{3}{16}$
16 20	$\frac{5}{72}$	0	$-\frac{5}{144}$	0	$\frac{1}{4}$	0	0	$-\frac{1}{8}$	$-\frac{5}{24}$	$-\frac{5}{16}$
19 20	$-\frac{1}{36}$	0	$\frac{1}{72}$	$\frac{1}{2}$	0	0	$-\frac{1}{4}$	0	$\frac{1}{12}$	$-\frac{1}{8}$
20 17	$\frac{1}{12}$	0	$-\frac{1}{24}$	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	0	$-\frac{1}{4}$	$\frac{3}{8}$

		$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{1}{2} \quad Y_4 = -\frac{2}{3}$															
B M		12225	12235	12425	12435	21225	22225	22235	22425	22435	12223	12233	12323	21223	21333	22223	22233
2 3		$-\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{48}$	$-\frac{3}{8}$	$-\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{24}$	0	0	0	0	0	0	0
2 8		$-\frac{1}{48}$	$-\frac{3}{16}$	$\frac{1}{48}$	$-\frac{1}{16}$	$-\frac{1}{8}$	$-\frac{1}{24}$	$-\frac{3}{8}$	$\frac{1}{24}$	$-\frac{1}{8}$	0	0	0	0	0	0	0
3 3		0	0	0	0	0	0	0	0	0	$\frac{1}{24}$	$-\frac{1}{24}$	$\frac{1}{8}$	$\frac{1}{4}$	$-\frac{1}{8}$	$\frac{1}{12}$	$-\frac{1}{12}$
3 8		0	0	0	0	0	0	0	0	0	$\frac{1}{72}$	$\frac{1}{8}$	$\frac{1}{24}$	$\frac{1}{12}$	$\frac{3}{8}$	$\frac{1}{36}$	$\frac{1}{4}$
4 1		$-\frac{1}{64}$	$\frac{1}{64}$	$-\frac{9}{64}$	$-\frac{3}{64}$	$-\frac{3}{32}$	$-\frac{1}{32}$	$\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{3}{32}$	$\frac{1}{96}$	$-\frac{1}{96}$	$-\frac{1}{32}$	$\frac{1}{16}$	$\frac{1}{32}$	$\frac{1}{48}$	$-\frac{1}{48}$
4 5		$\frac{1}{192}$	$-\frac{1}{192}$	$\frac{3}{64}$	$\frac{1}{64}$	$\frac{1}{32}$	$\frac{1}{96}$	$-\frac{1}{96}$	$\frac{3}{32}$	$\frac{1}{32}$	$\frac{1}{32}$	$-\frac{1}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$	$\frac{3}{32}$	$\frac{1}{16}$	$-\frac{1}{16}$
4 6		$-\frac{1}{192}$	$-\frac{3}{64}$	$-\frac{3}{64}$	$\frac{9}{64}$	$-\frac{1}{32}$	$-\frac{1}{96}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$\frac{9}{32}$	$\frac{1}{288}$	$\frac{1}{32}$	$-\frac{1}{96}$	$\frac{1}{48}$	$-\frac{3}{32}$	$\frac{1}{144}$	$\frac{1}{16}$
4 9		$\frac{1}{576}$	$\frac{1}{64}$	$\frac{1}{64}$	$-\frac{3}{64}$	$\frac{1}{96}$	$\frac{1}{288}$	$\frac{1}{32}$	$\frac{1}{32}$	$-\frac{3}{32}$	$\frac{1}{96}$	$\frac{1}{32}$	$-\frac{1}{32}$	$\frac{1}{16}$	$-\frac{9}{32}$	$\frac{1}{48}$	$\frac{3}{16}$
6 8		0	0	0	0	0	0	0	0	0	$\frac{1}{9}$	0	0	$-\frac{1}{6}$	0	$\frac{2}{9}$	0
7 6		$-\frac{1}{6}$	0	0	0	$\frac{1}{4}$	$-\frac{1}{3}$	0	0	0	$-\frac{1}{36}$	0	0	$\frac{1}{24}$	0	$-\frac{1}{18}$	0
7 9		$\frac{1}{18}$	0	0	0	$-\frac{1}{12}$	$\frac{1}{9}$	0	0	0	$-\frac{1}{12}$	0	0	$\frac{1}{8}$	0	$-\frac{1}{6}$	0
10 13		$\frac{1}{4}$	$\frac{1}{16}$	0	$-\frac{1}{48}$	0	$-\frac{1}{8}$	$-\frac{1}{32}$	0	$\frac{1}{96}$	0	0	0	0	0	0	0
10 18		$\frac{1}{12}$	$-\frac{3}{16}$	0	$\frac{1}{16}$	0	$-\frac{1}{24}$	$\frac{3}{32}$	0	$-\frac{1}{32}$	0	0	0	0	0	0	0
11 13		0	0	0	0	0	0	0	0	0	$-\frac{1}{6}$	$-\frac{1}{24}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$\frac{1}{48}$
11 18		0	0	0	0	0	0	0	0	0	$-\frac{1}{18}$	$\frac{1}{8}$	$\frac{1}{24}$	0	0	$\frac{1}{36}$	$-\frac{1}{16}$
12 11		$\frac{1}{16}$	$\frac{1}{64}$	0	$\frac{3}{64}$	0	$-\frac{1}{32}$	$-\frac{1}{128}$	0	$-\frac{3}{128}$	$-\frac{1}{24}$	$-\frac{1}{96}$	$-\frac{1}{32}$	0	0	$\frac{1}{48}$	$\frac{1}{192}$
12 15		$-\frac{1}{48}$	$-\frac{1}{192}$	0	$-\frac{1}{64}$	0	$\frac{1}{96}$	$\frac{384}{1}$	0	$\frac{1}{128}$	$-\frac{1}{8}$	$-\frac{1}{32}$	$-\frac{3}{32}$	0	0	$\frac{1}{16}$	$\frac{1}{64}$
12 16		$\frac{1}{48}$	$-\frac{3}{64}$	0	$-\frac{9}{64}$	0	$-\frac{1}{96}$	$\frac{3}{128}$	0	$\frac{9}{128}$	$-\frac{1}{72}$	$\frac{1}{32}$	$-\frac{1}{96}$	0	0	$\frac{1}{144}$	$-\frac{1}{64}$
12 19		$-\frac{1}{144}$	$\frac{1}{64}$	0	$\frac{3}{64}$	0	$\frac{1}{288}$	$-\frac{1}{128}$	0	$-\frac{3}{128}$	$-\frac{1}{24}$	$\frac{1}{32}$	$-\frac{1}{32}$	0	0	$\frac{1}{48}$	$-\frac{3}{64}$
14 18		$\frac{1}{12}$	0	$\frac{1}{12}$	0	0	$-\frac{1}{24}$	0	$-\frac{1}{24}$	0	0	0	0	0	0	0	0
15 18		0	0	0	0	0	0	0	0	0	$-\frac{1}{18}$	0	$-\frac{1}{6}$	0	0	$\frac{1}{36}$	0
16 16		$\frac{1}{48}$	0	$-\frac{3}{16}$	0	0	$-\frac{1}{96}$	0	$\frac{3}{32}$	0	$-\frac{1}{72}$	0	$\frac{1}{24}$	0	0	$\frac{1}{144}$	0
16 19		$-\frac{1}{144}$	0	$\frac{1}{16}$	0	0	$\frac{1}{288}$	0	$-\frac{1}{32}$	0	$-\frac{1}{24}$	0	$\frac{1}{8}$	0	0	$\frac{1}{48}$	0
18 13		0	0	0	0	0	0	0	0	0	$\frac{1}{24}$	$-\frac{1}{24}$	0	0	0	$-\frac{1}{48}$	$\frac{1}{48}$
18 18		0	0	0	0	0	0	0	0	0	$\frac{1}{72}$	$\frac{1}{8}$	0	0	0	$-\frac{1}{144}$	$-\frac{1}{16}$
19 11		$-\frac{1}{16}$	$\frac{1}{16}$	0	0	0	$\frac{1}{32}$	$-\frac{1}{32}$	0	0	$-\frac{1}{96}$	$\frac{1}{96}$	0	0	0	$\frac{1}{192}$	$-\frac{1}{192}$
19 15		$\frac{1}{48}$	$-\frac{1}{48}$	0	0	0	$-\frac{1}{96}$	$\frac{1}{96}$	0	0	$-\frac{1}{32}$	$\frac{1}{32}$	0	0	0	$\frac{1}{64}$	$-\frac{1}{64}$
19 16		$-\frac{1}{48}$	$-\frac{3}{16}$	0	0	0	$\frac{1}{96}$	$\frac{3}{32}$	0	0	$-\frac{1}{288}$	$-\frac{1}{32}$	0	0	0	$\frac{1}{576}$	$\frac{1}{64}$
19 19		$\frac{1}{144}$	$\frac{1}{16}$	0	0	0	$-\frac{1}{288}$	$-\frac{1}{32}$	0	0	$-\frac{1}{96}$	$-\frac{3}{32}$	0	0	0	$\frac{1}{192}$	$\frac{3}{64}$
21 13		0	0	$\frac{1}{4}$	$-\frac{1}{12}$	0	0	0	$-\frac{1}{8}$	$\frac{1}{24}$	0	0	0	0	0	0	0
21 18		0	0	$\frac{1}{12}$	$\frac{1}{4}$	0	0	0	$-\frac{1}{24}$	$-\frac{1}{8}$	0	0	0	0	0	0	0

B M	22323	12123	22123	23225	23425	24235	24425	24435	23223	23333	24233	24323	24225	24223	23133
2 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 3	$\frac{1}{4}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 8	$\frac{1}{12}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 1	$-\frac{1}{16}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 5	$-\frac{3}{16}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 6	$-\frac{1}{48}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4 9	$-\frac{1}{16}$	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 8	0	$\frac{1}{6}$	$\frac{1}{3}$	0	0	0	0	0	0	0	0	0	0	0	0
7 6	0	$\frac{1}{24}$	$\frac{1}{12}$	0	0	0	0	0	0	0	0	0	0	0	0
7 9	0	$\frac{1}{8}$	$\frac{1}{4}$	0	0	0	0	0	0	0	0	0	0	0	0
10 13	0	0	0	$\frac{3}{16}$	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{1}{8}$	$-\frac{1}{32}$	0	0	0	0	0	0	0
10 18	0	0	0	$\frac{1}{16}$	$-\frac{1}{48}$	$-\frac{9}{32}$	$-\frac{1}{24}$	$\frac{3}{32}$	0	0	0	0	0	0	0
11 13	$-\frac{1}{16}$	0	0	0	0	0	0	0	$-\frac{1}{8}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{3}{16}$	0	0	0
11 18	$-\frac{1}{48}$	0	0	0	0	0	0	0	$-\frac{1}{24}$	$-\frac{3}{8}$	$\frac{3}{16}$	$\frac{1}{16}$	0	0	0
12 11	$\frac{1}{64}$	0	0	$\frac{3}{64}$	$\frac{9}{64}$	$\frac{3}{128}$	$\frac{9}{32}$	$\frac{9}{128}$	$-\frac{1}{32}$	$-\frac{1}{32}$	$-\frac{1}{64}$	$-\frac{3}{64}$	0	0	0
12 15	$\frac{3}{64}$	0	0	$-\frac{1}{64}$	$-\frac{3}{64}$	$-\frac{1}{128}$	$-\frac{3}{32}$	$-\frac{3}{128}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{3}{64}$	$-\frac{9}{64}$	0	0	0
12 16	$\frac{1}{192}$	0	0	$\frac{1}{64}$	$\frac{3}{64}$	$-\frac{9}{128}$	$\frac{3}{32}$	$-\frac{27}{128}$	$-\frac{1}{96}$	$\frac{3}{32}$	$\frac{3}{64}$	$-\frac{1}{64}$	0	0	0
12 19	$\frac{1}{64}$	0	0	$-\frac{1}{192}$	$-\frac{1}{64}$	$\frac{3}{128}$	$-\frac{1}{32}$	$\frac{9}{128}$	$-\frac{1}{32}$	$\frac{9}{32}$	$\frac{9}{64}$	$-\frac{3}{64}$	0	0	0
14 18	0	0	0	$-\frac{1}{4}$	$-\frac{1}{12}$	0	$\frac{1}{24}$	0	0	0	0	0	$-\frac{3}{8}$	0	0
15 18	$\frac{1}{12}$	0	0	0	0	0	0	0	$\frac{1}{6}$	0	0	$\frac{1}{4}$	0	$\frac{1}{4}$	0
16 16	$-\frac{1}{48}$	0	0	$-\frac{1}{16}$	$\frac{3}{16}$	0	$-\frac{3}{32}$	0	$\frac{1}{24}$	0	0	$-\frac{1}{16}$	$-\frac{3}{32}$	$\frac{1}{16}$	0
16 19	$-\frac{1}{16}$	0	0	$\frac{1}{48}$	$-\frac{1}{16}$	0	$\frac{1}{32}$	0	$\frac{1}{8}$	0	0	$-\frac{3}{16}$	$\frac{1}{32}$	$\frac{3}{16}$	0
18 13	0	$-\frac{1}{4}$	$\frac{1}{8}$	0	0	0	0	0	$-\frac{1}{8}$	0	$\frac{1}{16}$	0	0	$\frac{3}{16}$	$-\frac{1}{8}$
18 18	0	$-\frac{1}{12}$	$\frac{1}{24}$	0	0	0	0	0	$-\frac{1}{24}$	0	$-\frac{3}{16}$	0	0	$\frac{1}{16}$	$\frac{3}{8}$
19 11	0	$-\frac{1}{16}$	$\frac{1}{32}$	$\frac{3}{16}$	0	$-\frac{3}{32}$	0	0	$\frac{1}{32}$	0	$-\frac{1}{64}$	0	$-\frac{9}{32}$	$-\frac{3}{64}$	$-\frac{1}{32}$
19 15	0	$-\frac{3}{16}$	$\frac{3}{32}$	$-\frac{1}{16}$	0	$\frac{1}{32}$	0	0	$\frac{3}{32}$	0	$-\frac{3}{64}$	0	$\frac{3}{32}$	$-\frac{9}{64}$	$-\frac{3}{32}$
19 16	0	$-\frac{1}{48}$	$\frac{1}{96}$	$\frac{1}{16}$	0	$\frac{9}{32}$	0	0	$\frac{1}{96}$	0	$\frac{3}{64}$	0	$-\frac{3}{32}$	$-\frac{1}{64}$	$\frac{3}{32}$
19 19	0	$-\frac{1}{16}$	$\frac{1}{32}$	$-\frac{1}{48}$	0	$-\frac{3}{32}$	0	0	$\frac{1}{32}$	0	$\frac{9}{64}$	0	$\frac{1}{32}$	$-\frac{3}{64}$	$\frac{9}{32}$
21 13	0	0	0	0	$\frac{1}{4}$	0	$-\frac{1}{8}$	$\frac{1}{8}$	0	0	0	0	0	0	0
21 18	0	0	0	0	$\frac{1}{12}$	0	$-\frac{1}{24}$	$-\frac{3}{8}$	0	0	0	0	0	0	0

$$Y = -1 \quad I = \frac{1}{2} \quad J = \frac{1}{2} \quad Y_4 = -\frac{5}{3}$$

B M	12224	12234	21224	22224	22234	12124	22124	23224	24234	24224	23134
4 4	$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$\frac{1}{6}$	0	0	0	0	0	0
4 10	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{6}$	$-\frac{1}{18}$	$-\frac{1}{2}$	0	0	0	0	0	0
7 10	$-\frac{1}{18}$	0	$\frac{1}{12}$	$-\frac{1}{9}$	0	$-\frac{1}{4}$	$-\frac{1}{2}$	0	0	0	0
8 7	$\frac{1}{6}$	0	$-\frac{1}{4}$	$\frac{1}{3}$	0	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0
12 14	$\frac{1}{3}$	$\frac{1}{12}$	0	$-\frac{1}{6}$	$-\frac{1}{24}$	0	0	$\frac{1}{4}$	$\frac{1}{8}$	0	0
12 20	$\frac{1}{9}$	$-\frac{1}{4}$	0	$-\frac{1}{18}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$-\frac{3}{8}$	0	0
16 20	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	$-\frac{1}{2}$	0
19 14	$-\frac{1}{48}$	$\frac{1}{48}$	0	$\frac{1}{96}$	$-\frac{1}{96}$	$\frac{3}{8}$	$-\frac{3}{16}$	$\frac{1}{16}$	$-\frac{1}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$
19 20	$-\frac{1}{144}$	$-\frac{1}{16}$	0	$\frac{1}{288}$	$\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{1}{48}$	$\frac{3}{32}$	$-\frac{1}{32}$	$-\frac{9}{16}$
20 12	$\frac{1}{16}$	$-\frac{1}{16}$	0	$-\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{9}{32}$	$\frac{1}{16}$
20 17	$\frac{1}{48}$	$\frac{3}{16}$	0	$-\frac{1}{96}$	$-\frac{3}{32}$	$\frac{1}{24}$	$-\frac{1}{48}$	$-\frac{1}{16}$	$-\frac{9}{32}$	$\frac{3}{32}$	$-\frac{3}{16}$

$$Y = -2 \quad I = 1 \quad J = \frac{5}{2} \quad Y_4 = -\frac{5}{3}$$

B M	12214	21114	22214
7 8	$-\frac{1}{12}$	$\frac{3}{4}$	$-\frac{1}{6}$
8 6	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$
16 18	$-\frac{2}{3}$	0	$\frac{1}{3}$

$Y = -2 \quad I = 1 \quad J = \frac{3}{2} \quad Y_4 = -\frac{5}{3}$											
B M	12224	21224	22224	12124	12214	21114	22124	22214	23224	24224	
4 8	$\frac{1}{9}$	$\frac{2}{3}$	$\frac{2}{9}$	0	0	0	0	0	0	0	
7 3	$-\frac{1}{48}$	$\frac{1}{32}$	$-\frac{1}{24}$	$-\frac{3}{32}$	$-\frac{5}{96}$	$\frac{15}{32}$	$-\frac{3}{16}$	$-\frac{5}{48}$	0	0	
7 8	$\frac{5}{144}$	$-\frac{5}{96}$	$\frac{5}{72}$	$\frac{5}{32}$	$-\frac{1}{32}$	$\frac{9}{32}$	$\frac{5}{16}$	$-\frac{1}{16}$	0	0	
8 1	$\frac{1}{16}$	$-\frac{3}{32}$	$\frac{1}{8}$	$-\frac{1}{32}$	$\frac{5}{32}$	$\frac{5}{32}$	$-\frac{1}{16}$	$\frac{5}{16}$	0	0	
8 6	$-\frac{5}{48}$	$\frac{5}{32}$	$-\frac{5}{24}$	$\frac{5}{96}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{5}{48}$	$\frac{3}{16}$	0	0	
12 18	$-\frac{4}{9}$	0	$\frac{2}{9}$	0	0	0	0	0	$-\frac{1}{3}$	0	
16 13	$\frac{1}{24}$	0	$-\frac{1}{48}$	0	$-\frac{5}{12}$	0	0	$\frac{5}{24}$	$-\frac{1}{8}$	$-\frac{3}{16}$	
16 18	$-\frac{5}{72}$	0	$\frac{5}{144}$	0	$-\frac{1}{4}$	0	0	$\frac{1}{8}$	$\frac{5}{24}$	$\frac{5}{16}$	
19 18	$\frac{1}{36}$	0	$-\frac{1}{72}$	$-\frac{1}{2}$	0	0	$\frac{1}{4}$	0	$-\frac{1}{12}$	$\frac{1}{8}$	
20 16	$-\frac{1}{12}$	0	$\frac{1}{24}$	$-\frac{1}{6}$	0	0	$\frac{1}{12}$	0	$\frac{1}{4}$	$-\frac{3}{8}$	
$Y = -2 \quad I = 1 \quad J = \frac{1}{2} \quad Y_4 = -\frac{5}{3}$											
B M	12224	12234	21224	22224	22234	12124	22124	23224	24234	24224	23134
4 3	$\frac{1}{12}$	$-\frac{1}{12}$	$\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	0	0	0	0	0	0
4 8	$\frac{1}{36}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{18}$	$\frac{1}{2}$	0	0	0	0	0	0
7 8	$\frac{1}{18}$	0	$-\frac{1}{12}$	$\frac{1}{9}$	0	$\frac{1}{4}$	$\frac{1}{2}$	0	0	0	0
8 6	$-\frac{1}{6}$	0	$\frac{1}{4}$	$-\frac{1}{3}$	0	$\frac{1}{12}$	$\frac{1}{6}$	0	0	0	0
12 13	$-\frac{1}{3}$	$-\frac{1}{12}$	0	$\frac{1}{6}$	$\frac{1}{24}$	0	0	$-\frac{1}{4}$	$-\frac{1}{8}$	0	0
12 18	$-\frac{1}{9}$	$\frac{1}{4}$	0	$\frac{1}{18}$	$-\frac{1}{8}$	0	0	$-\frac{1}{12}$	$\frac{3}{8}$	0	0
16 18	$-\frac{1}{9}$	0	0	$\frac{1}{18}$	0	0	0	$\frac{1}{3}$	0	$\frac{1}{2}$	0
19 13	$\frac{1}{48}$	$-\frac{1}{48}$	0	$-\frac{1}{96}$	$\frac{1}{96}$	$-\frac{3}{8}$	$\frac{3}{16}$	$-\frac{1}{16}$	$\frac{1}{32}$	$\frac{3}{32}$	$-\frac{3}{16}$
19 18	$\frac{1}{144}$	$\frac{1}{16}$	0	$-\frac{1}{288}$	$-\frac{1}{32}$	$-\frac{1}{8}$	$\frac{1}{16}$	$-\frac{1}{48}$	$-\frac{3}{32}$	$\frac{1}{32}$	$\frac{9}{16}$
20 11	$-\frac{1}{16}$	$\frac{1}{16}$	0	$\frac{1}{32}$	$-\frac{1}{32}$	$-\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{16}$	$-\frac{3}{32}$	$-\frac{9}{32}$	$-\frac{1}{16}$
20 16	$-\frac{1}{48}$	$-\frac{3}{16}$	0	$\frac{1}{96}$	$\frac{3}{32}$	$-\frac{1}{24}$	$\frac{1}{48}$	$\frac{1}{16}$	$\frac{9}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$
$Y = -2 \quad I = 0 \quad J = \frac{5}{2} \quad Y_4 = -\frac{5}{3}$											
B M	12214	21114	22214								
7 8	$\frac{1}{12}$	$-\frac{3}{4}$	$\frac{1}{6}$								
8 9	$-\frac{1}{4}$	$-\frac{1}{4}$	$-\frac{1}{2}$								
16 18	$\frac{2}{3}$	0	$-\frac{1}{3}$								
$Y = -2 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = -\frac{8}{3}$											
B M	21115										
8 10	1										
$Y = -2 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = -\frac{5}{3}$											
B M	12224	21224	22224	12124	12214	21114	22124	22214	23224	24224	
4 8	$-\frac{1}{9}$	$-\frac{2}{3}$	$-\frac{2}{9}$	0	0	0	0	0	0	0	
7 3	$\frac{1}{48}$	$-\frac{1}{32}$	$\frac{1}{24}$	$\frac{3}{32}$	$\frac{5}{96}$	$-\frac{15}{32}$	$\frac{3}{16}$	$\frac{5}{48}$	0	0	
7 8	$-\frac{5}{144}$	$\frac{5}{96}$	$-\frac{5}{72}$	$-\frac{5}{32}$	$\frac{1}{32}$	$-\frac{9}{32}$	$-\frac{5}{16}$	$\frac{1}{16}$	0	0	
8 5	$-\frac{1}{16}$	$\frac{3}{32}$	$-\frac{1}{8}$	$\frac{1}{32}$	$-\frac{5}{32}$	$-\frac{5}{32}$	$\frac{1}{16}$	$-\frac{5}{16}$	0	0	
8 9	$\frac{5}{48}$	$-\frac{5}{32}$	$\frac{5}{24}$	$-\frac{5}{96}$	$-\frac{3}{32}$	$-\frac{3}{32}$	$-\frac{5}{48}$	$-\frac{3}{16}$	0	0	
12 18	$\frac{4}{9}$	0	$-\frac{2}{9}$	0	0	0	0	0	$\frac{1}{3}$	0	
16 13	$-\frac{1}{24}$	0	$\frac{1}{48}$	0	$\frac{5}{12}$	0	0	$-\frac{5}{24}$	$\frac{1}{8}$	$\frac{3}{16}$	
16 18	$\frac{5}{72}$	0	$-\frac{5}{144}$	0	$\frac{1}{4}$	0	0	$-\frac{1}{8}$	$-\frac{5}{24}$	$-\frac{5}{16}$	
19 18	$-\frac{1}{36}$	0	$\frac{1}{72}$	$\frac{1}{2}$	0	0	$-\frac{1}{4}$	0	$\frac{1}{12}$	$-\frac{1}{8}$	
20 19	$\frac{1}{12}$	0	$-\frac{1}{24}$	$\frac{1}{6}$	0	0	$-\frac{1}{12}$	0	$-\frac{1}{4}$	$\frac{3}{8}$	
$Y = -2 \quad I = 0 \quad J = \frac{3}{2} \quad Y_4 = -\frac{8}{3}$											
B M	12125	21115	22125								
8 4	$-\frac{1}{8}$	$\frac{5}{8}$	$-\frac{1}{4}$								
8 10	$\frac{5}{24}$	$\frac{3}{8}$	$\frac{5}{12}$								
20 20	$-\frac{2}{3}$	0	$\frac{1}{3}$								

$Y = -2 \quad I = 0 \quad J = \frac{1}{2} \quad Y_4 = -\frac{5}{3}$											
B M	12224	12234	21224	22224	22234	12124	22124	23224	24234	24224	23134
4 3	$-\frac{1}{12}$	$\frac{1}{12}$	$-\frac{1}{2}$	$-\frac{1}{6}$	$\frac{1}{6}$	0	0	0	0	0	0
4 8	$-\frac{1}{36}$	$-\frac{1}{4}$	$-\frac{1}{6}$	$-\frac{1}{18}$	$-\frac{1}{2}$	0	0	0	0	0	0
7 8	$-\frac{1}{18}$	0	$\frac{1}{12}$	$-\frac{1}{9}$	0	$-\frac{1}{4}$	$-\frac{1}{2}$	0	0	0	0
8 9	$\frac{1}{6}$	0	$-\frac{1}{4}$	$\frac{1}{3}$	0	$-\frac{1}{12}$	$-\frac{1}{6}$	0	0	0	0
12 13	$\frac{1}{3}$	$\frac{1}{12}$	0	$-\frac{1}{6}$	$-\frac{1}{24}$	0	0	$\frac{1}{4}$	$\frac{1}{8}$	0	0
12 18	$\frac{1}{9}$	$-\frac{1}{4}$	0	$-\frac{1}{18}$	$\frac{1}{8}$	0	0	$\frac{1}{12}$	$-\frac{3}{8}$	0	0
16 18	$\frac{1}{9}$	0	0	$-\frac{1}{18}$	0	0	0	$-\frac{1}{3}$	0	$-\frac{1}{2}$	0
19 13	$-\frac{1}{48}$	$\frac{1}{48}$	0	$\frac{1}{96}$	$-\frac{1}{96}$	$\frac{3}{8}$	$-\frac{3}{16}$	$\frac{1}{16}$	$-\frac{1}{32}$	$-\frac{3}{32}$	$\frac{3}{16}$
19 18	$-\frac{1}{144}$	$-\frac{1}{16}$	0	$\frac{1}{288}$	$\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$\frac{1}{48}$	$\frac{3}{32}$	$-\frac{1}{32}$	$-\frac{9}{16}$
20 15	$\frac{1}{16}$	$-\frac{1}{16}$	0	$-\frac{1}{32}$	$\frac{1}{32}$	$\frac{1}{8}$	$-\frac{1}{16}$	$-\frac{3}{16}$	$\frac{3}{32}$	$\frac{9}{32}$	$\frac{1}{16}$
20 19	$\frac{1}{48}$	$\frac{3}{16}$	0	$-\frac{1}{96}$	$-\frac{3}{32}$	$\frac{1}{24}$	$-\frac{1}{48}$	$-\frac{1}{16}$	$-\frac{9}{32}$	$\frac{3}{32}$	$-\frac{3}{16}$
$Y = -2 \quad I = 0 \quad J = \frac{1}{2} \quad Y_4 = -\frac{8}{3}$											
B M	12125	22125	23135								
8 10	$\frac{1}{3}$	$\frac{2}{3}$	0								
20 14	$-\frac{1}{2}$	$\frac{1}{4}$	$-\frac{1}{4}$								
20 20	$-\frac{1}{6}$	$\frac{1}{12}$	$\frac{3}{4}$								
$Y = -3 \quad I = \frac{1}{2} \quad J = \frac{5}{2} \quad Y_4 = -\frac{8}{3}$											
B M	21115										
8 8	-1										
$Y = -3 \quad I = \frac{1}{2} \quad J = \frac{3}{2} \quad Y_4 = -\frac{8}{3}$											
B M	12125	21115	22125								
8 3	$\frac{1}{8}$	$-\frac{5}{8}$	$\frac{1}{4}$								
8 8	$-\frac{5}{24}$	$-\frac{3}{8}$	$-\frac{5}{12}$								
20 18	$\frac{2}{3}$	0	$-\frac{1}{3}$								
$Y = -3 \quad I = \frac{1}{2} \quad J = \frac{1}{2} \quad Y_4 = -\frac{8}{3}$											
B M	12125	22125	23135								
8 8	$-\frac{1}{3}$	$-\frac{2}{3}$	0								
20 13	$\frac{1}{2}$	$-\frac{1}{4}$	$\frac{1}{4}$								
20 18	$\frac{1}{6}$	$-\frac{1}{12}$	$-\frac{3}{4}$								

Table A2. Indices of baryons and mesons. The subscript 8 means color octet; the superscript $\frac{1}{2}$ refers to the spin of baryon. Λ_s is the flavor singlet Λ .

B	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Baryon	N	Λ	Σ	Ξ	Δ	Σ^*	Ξ^*	Ω	N_8	Λ_8	Σ_8	Ξ_8	N_8^*	Λ_8^*	Σ_8^*	Ξ_8^*	$\Delta_8^{\frac{1}{2}}$	Σ_8	Ξ_8	$\Omega_8^{\frac{1}{2}}$	Λ_{s8}
M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Meson	π	K	\bar{K}	η	η'	ρ	K^*	\bar{K}^*	ω	φ	π_8	K_8	\bar{K}_8	η_8	η'_8	ρ_8	K_8^*	\bar{K}_8^*	ω_8	φ_8	